

1998 ANNUAL REMEDIAL ACTION  
GROUND-WATER MONITORING REPORT

ORMET CORPORATION SUPERFUND SITE  
HANNIBAL, OHIO

MARCH 29, 1999

Prepared for:

Ormet Corporation  
Hannibal, Ohio

EPA Region 5 Records Ctr.



311551

Prepared by:



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March 31, 1999

Mr. Bernie Schorle  
Remedial Project Manager  
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USEPA Region V  
77 West Jackson Blvd.  
Chicago, IL 60604-3590

Dear Mr. Schorle:

Enclosed are two copies of the 1998 Annual Ground-Water Monitoring Report for the Ormet Superfund site. The report has been prepared in accordance with the Remedial Action Ground-Water Monitoring Plan (Revision 1 – April 28, 1997), which was submitted to the USEPA during Remedial Design.

Very truly yours,

A handwritten signature in black ink, appearing to read "John Reggi".

John Reggi, Director  
Corporate Environmental Services

JDR:cr

Enclosures

c: Kris Vanekco

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**1998 ANNUAL REMEDIAL ACTION  
GROUND-WATER MONITORING REPORT  
ORMET CORPORATION SUPERFUND SITE  
HANNIBAL, OHIO**

**BACKGROUND/INTRODUCTION**

Under the terms of a Consent Decree entered on December 18, 1995 between the United States Environmental Protection Agency (USEPA) and the Ormet Primary Aluminum Corporation for the Ormet Corporation Superfund Site, Ormet has undertaken Remedial Action (RA) at the site consisting of the following:

- Containment of the plume in the alluvial aquifer through continued pumping of the interceptor wells and Ormet Ranney well and treatment of ground water pumped by the interceptor wells using ferrous salt precipitation;
- Installation and operation of a soil flushing system in the Former Spent Potliner Storage Area (FSPSA);
- Capping of the former CMSD with a multi-layer cap, including construction of a TSCA-compliant cell within the CMSD for disposal of backwater area sediment containing PCBs;
- Installation of a drain system around the toe of the former CMSD to collect seeps, with treatment of the collected seep water using activated carbon followed by treatment at the ground-water treatment plant;
- Excavation of carbon material from the former carbon runoff and deposition area and disposal of the material in the former Construction Material Scrap Dump (CMSD);
- Excavation of sediment from the former Outfall 004 backwater area and disposal of the sediment in the CMSD; and
- Relocation of the Outfall 004 channel.

Areas of the site that were subject to remedial action are shown in Figure 1.

Remedial construction was initiated in April 1997 and was certified as being complete in August 1998. During the period from August 1998 through October 1998, the FSPSA soil flushing system was operated on a trial basis, with flushing occurring for a period of approximately three hours per day. Beginning in the spring of 1999, full operation of the soil flushing system is anticipated (i.e., flushing for eight hours per day).

As specified in the Statement of Work (SOW) attached to the Consent Decree, Ormet began a program of routine ground-water monitoring in conjunction with the completion of remedial construction. The purpose of ground-water monitoring is to document/evaluate changes in ground-water conditions beneath the site associated with the remedial actions. To provide a baseline characterization of ground-water conditions immediately prior to remedial activities, a sitewide ground-water monitoring event was conducted during May 5 to 9, 1997. Routine ground-water monitoring was initiated in May 1998. Ground-water monitoring activities have been conducted in accordance with the Remedial Action Ground-Water Monitoring Plan (Revision 1 - April 28, 1997), which was submitted to the USEPA during Remedial Design.

### **SUMMARY OF GROUND-WATER MONITORING PROGRAM**

The current system of ground-water monitoring wells and piezometers at the Ormet site is shown in Figure 1. Under the RA Ground-Water Monitoring Plan, monitoring is to be conducted three times per year (approximately once every four months), beginning no later than four months following completion of remedial construction. In 1998, two ground-water monitoring events were conducted, during May 4 to 8 and August 31 to September 1.

Each monitoring event included measurement of water-level elevations at all MW- and TH-series monitoring wells, PPB-series piezometers monitoring the alluvial aquifer, and at the Ohio River pool measuring point RP-1. Water-level elevation data collected in conjunction with the baseline monitoring event (May 1997) and the 1998 monitoring events are provided in Tables 1, 2, and 3, respectively.

During each monitoring event, ground-water samples were collected from the following wells located within and downgradient of the FSPSA:

MW - 2	MW - 31
MW - 5	MW - 32
MW - 16	MW - 35
MW - 18	MW - 36
MW - 28	MW - 37

Each monitoring event also included sampling of monitoring well MW - 12, located immediately downgradient of the CMSD. These wells were identified in the RA Ground-Water Monitoring Plan as Points of Compliance, as required under Section II.6. of the Consent Decree SOW.

The RA Ground-Water Monitoring Plan specifies that one monitoring event each year is to be an expanded monitoring event which includes sampling of selected wells not hydraulically

downgradient from any of the potential source areas at the site (i.e., background wells) and additional wells located within the plume outside of the FSPSA. These wells include the following:

MW-1	MW-29S & D
MW-7 (background)	MW-30
MW-8	MW-34S & D
MW-10	MW-39S & D
MW-11	MW-40S & D
MW-15	MW-41 (background)
MW-17	MW-42S & D
MW-19 (background)	

Water Sampling Log forms for the May 1997 baseline monitoring event and for each of the routine monitoring events conducted during 1998 are provided in Appendix A.

The primary purpose of the annual expanded monitoring event is to collect data to facilitate preparation of plume isopleth maps. Based on the isopleth maps, estimates of contaminant mass-in-place and the total area of the aquifer exceeding cleanup goals for selected indicator parameters were made and compared with estimates based on historical monitoring results as a means of assessing the progress of the remediation program. The expanded monitoring event to characterize baseline conditions at the start of remedial construction in 1997, and the expanded monitoring event for 1998 were both conducted in May to enable more direct comparison of the associated estimates of contaminant mass-in-place and aquifer area exceeding cleanup goals.

Ground-water samples from all monitoring wells were analyzed for constituents for which cleanup goals were specified in the Record of Decision (ROD) for the site; i.e., arsenic, beryllium, cyanide, manganese, vanadium, and fluoride. Samples were also analyzed for pH, specific conductance, and sodium, which are additional indicators of the plume in the alluvial aquifer. Terachlorothene (PCE) was analyzed in samples from the MW-2, MW-5, MW-18, MW-30, and

MW-31 monitoring wells, in which PCE was detected during the Remedial Investigation (RI). Ground-water analyses were performed by Kemron Environmental Services, Inc. (Kemron) of Marietta, OH. Kemron also provided analytical services during the RI, for treatability testing performed during Remedial Design, and during remedial construction. Methods used by Kemron to analyze ground-water samples from the RA monitoring events were as shown below.

<u>Analytical Parameter</u>	<u>Analytical Method</u>	<u>Ground-Water Clean-Up Goal (ug/L)</u>	<u>Reporting Limit (ug/L)</u>
Arsenic	SW846/6010A-trace ICP	10*	4
Beryllium	SW846/6010A-trace ICP	4	0.5
Manganese	SW846/6010A	230*	10
Vanadium	SW846/6010A	260	10
Cyanide (total)	SW846/9010A	N/A	10
Cyanide (amenable)	SW846/9010A	200	10
Fluoride	EPA 340.2	4000	100
Tetrachloroethene	SW846/8260A	5	5
pH	EPA 150.1	N/A	N/A
Specific Conductance	EPA 120.1	N/A	N/A
Sodium	SW846/6010A	N/A	500

N/A - Not Applicable

- \* - Final determination of cleanup goals for arsenic and manganese are pending. The USEPA and Ormet negotiated a Consent Decree and associated Statement of Work for implementation of the ROD. Because arsenic and manganese are common ground-water constituents in the Ohio River Valley and can occur naturally at concentrations above the cleanup goals presented in the ROD, the SOW specified that as part of the remedial Design process, Ormet would conduct a statistical evaluation to determine background levels of arsenic and manganese in the alluvial aquifer. The resulting background levels would then be considered for use as cleanup goals in place of the levels presented in the ROD. The results of the statistical analyses, which were presented to USEPA in the August 28, 1996 HydroSystems Management, Inc. report titled, "Statistical Analyses of Background Levels of Manganese and Arsenic in Ground Water", indicated background levels of 40 ug/L for arsenic and 9,780 ug/L for manganese.

Laboratory analytical reports for the May 1997 baseline monitoring event and for the two monitoring events conducted during 1998 are provided in Appendix B. The analytical results are summarized in Table 4. For purposes of comparison, Table 4 also includes available historical results for the

parameters and wells being monitored. Analytical results for the 1998 monitoring events were validated by applying principles and concepts of the USEPA National Functional Guidelines. A data validation summary report is provided in Appendix C.

## **RESULTS OF 1997/1998 REMEDIAL ACTION GROUND-WATER MONITORING**

### **GROUND-WATER FLOW**

Water-level elevation data collected during the baseline monitoring event and the 1998 monitoring events (Tables 1 through 3) were used to construct the water table contour maps shown in Figures 2, 3, and 4. The ground-water elevation contours and associated ground-water flow patterns shown in Figures 2 through 4 are consistent with those previously mapped, indicating that the ground-water pumping component of the site remedy is effective in containing the plume in the alluvial aquifer beneath the Ormet Reduction Mill property and extracting contaminated ground water for treatment at Ormet's ground-water treatment plant. Ground-water flow in the alluvial aquifer is generally from northeast to southwest, toward the Ormet Reduction Mill Ranney well and interceptor wells. Current pumping maintains the water table at an elevation that is below the pool elevation of the Ohio River and a hydraulic potential does not exist for the natural discharge of ground water from the alluvial aquifer to the Ohio River along the river/plant boundary. The ground-water elevation contour map for the September 1998 monitoring event (Figure 4), indicates that the part-time operation of the FSPSA soil flushing system had no discernable effect on ground-water flow patterns beneath that area of the site.

Pumping by the Ormet Reduction Mill Ranney well and the Ormet Rolling Mill Ranney well (located approximately 2000 feet west of the Reduction Mill Ranney well) have created large cones of influence around each pumping center, which converge to form a gently rounded ground-water divide that is situated roughly parallel to and west of the fenceline separating the two plants. A ground-water divide is hydraulically a high point, or ridge, in the surface of the water table. The ground-water divide creates a hydraulic barrier, such that ground water on the west side of the divide flows toward the Rolling Mill Ranney well, and ground water on the east side flows toward the Reduction Mill Ranney well and interceptor well. By this condition, a hydraulic potential does not exist for ground water beneath the Reduction Mill to flow toward the Rolling Mill Ranney well.



## **GROUND-WATER QUALITY**

### **Time vs. Concentration Trends**

To evaluate changes in plume concentrations within the alluvial aquifer beneath the Ormet site, concentration versus time graphs were prepared for each monitoring parameter for which a cleanup goal was established in the ROD, with each parameter being graphed separately for each of the compliance point wells identified in the RA Ground-Water Monitoring Plan (see Appendix D). Analytical results for sodium have also been graphed, because it is an additional indicator of overall water quality in the plume. The graphs show the analytical results for the May 1997 and May and September 1998 monitoring events, along with other historical data. Summaries of time versus concentration trends and comparisons of the latest reported concentrations versus cleanup goals or background concentrations for the compliance wells are provided in the following tables.

## SUMMARY OF TIME VS. CONCENTRATION TRENDS

	AMEN.						
	CN	As	Be	Mn	V	F	Na
<u>Wells within FSPSA</u>							
MW - 32	--	↓	--	↑	--	↓	↓
MW - 35	↑	↓	--	↑	--	↓	↓
MW - 36	--	↑	--	↑	--	↑	↑
MW - 37	--	↓	--	↓	--	↓	↓
<u>Downgradient Edge of FSPSA</u>							
MW - 16	↑	↓	--	↓↑	--	↓	↓
MW - 18	↓	--	--	--	↓↑	↓	↓
MW - 28	↓	--	--	--	--	--	--
MW - 31	--	--	↑	↓↑	↑	--	--
<u>Mid - Plant Area</u>							
MW - 2	↓	↓	--	--↓	↓	↓	↓
MW - 5	↓	↓	--	↓	--	↓	↓
<u>Downgradient of CMSD</u>							
MW - 12	--	--	--	↑	--	↓	--

Amen. CN - Amenable Cyanide; As - Arsenic; Be - Beryllium; Mn - Manganese; V - Vanadium

F - Fluoride; Na - Sodium

↑ - Trend of increasing concentration. ↓ - Trend of decreasing concentration. -- No apparent trend.

Combinations of symbols indicate changes in trends.

**COMPARISON OF LATEST REPORTED CONCENTRATION  
VERSUS CLEANUP GOALS/BACKGROUND**

	AMEN.					
	CN	As	Be	Mn	V	F
<u>Wells within FSPSA</u>						
MW - 32		*	*	+	*	
MW - 35		*	*	+	*	
MW - 36	*		*	+	*	
MW - 37		+	*	+	*	
<u>Downgradient Edge of FSPSA</u>						
MW - 16		*	*	+	*	
MW - 18	*		*	+	*	*
MW - 28	*	*	*	*	*	
MW - 31	*	++	*	+	*	
<u>Mid-Plant Area</u>						
MW - 2			*	+	*	
MW - 5	*	*	*	*	*	
<u>Downgradient of CMSD</u>						
MW - 12	*	*	*	+	*	*

Amen. CN - Amenable Cyanide; As - Arsenic; Be - Beryllium; Mn - Manganese; V - Vanadium; F - Fluoride

\* - Latest result below ROD Cleanup Goal.

+ - Latest result above Cleanup Goal, but below background.

++ - Latest result above background, but below MCL.

Discussions of the time versus concentrations trends for each parameter for which a cleanup goal has been established are provided in the following sections.

### **Cyanide (Amenable to Chlorination)**

The cleanup goal for cyanide established in the ROD (0.2 mg/L) is the Safe Drinking Water Act Maximum Contaminant Level (MCL) for cyanide amenable to chlorination. Cyanide amenable to chlorination is that portion of total cyanide which is weakly bound in cyanide complexes or is in the form of free (non-complexed) cyanide. Cyanide amenable to chlorination is a more reactive form of cyanide than the more strongly bound metal-cyanide complexes (e.g., iron cyanide). The form of cyanide occurring in the ground water beneath the Ormet site appears to be predominantly the stable cyanide complexes, which exhibit relatively low toxicity. This interpretation is supported by the relative concentrations of total versus amenable or free cyanide reported in ground-water samples from the site; i.e., the concentration of amenable or free cyanide is typically much lower than the total cyanide concentration in a sample. As discussed later in the report, the area of the alluvial aquifer containing concentrations of amenable cyanide above the cleanup goal is much smaller than the area of aquifer containing total cyanide at levels above 0.2 mg/L.

Analyses for amenable cyanide tend to be subject to a higher degree of variability than other plume indicators, such as total cyanide and fluoride. Consequently, concentration versus time graphs for amenable cyanide are somewhat erratic and exhibit less consistent trends. For this reason, the long-term concentration trends for amenable cyanide at a given monitoring well are more significant than fluctuations observed from one monitoring event to the next.

Concentration versus time graphs for amenable cyanide are presented in Appendix D-1. At six of the eleven compliance point wells, the most recently reported amenable cyanide concentration was below the clean-up goal of 0.2 mg/L. At three of the wells (MW-2, MW-18, MW-28) amenable cyanide concentrations show a downward trend relative to historical data. At two of the wells (MW-16 and, recently, MW-35), amenable cyanide concentrations exhibit an upward trend.

## **Fluoride**

Of the main plume indicators, fluoride is less prone to analytical variability than cyanide, and potentially a more reliable indicator of changes in overall plume quality. Concentration versus time graphs for fluoride for each of the compliance wells are provided in Appendix D-2.

The most recent result for fluoride was below the cleanup goal of 4 mg/L at two of the eleven compliance point wells, MW-12 and MW-28, and a downward concentration trend was observed at eight of the compliance wells (MW-2, MW-5, MW-12, MW-16, MW-18, MW-32, MW-35, and MW-37). The only compliance well in which the concentration of fluoride appears to be increasing is MW-36.

## **Arsenic**

Concentration versus time graphs for arsenic for each of the compliance point wells are provided in Appendix D- 3. At six of the eleven compliance point wells, MW-2, MW-5, MW-16, MW-32, MW-35, and MW-37, the concentrations of arsenic reported during recent sampling events are substantially lower than levels reported during the Phase I RI. For three of these wells (MW-32, MW-35, MW-37), the data exhibit a continuing downward trend. Data for the MW-36 well show an increasing trend.

As discussed earlier in this report, the final cleanup goal for arsenic is pending. In the ROD, the cleanup goal for arsenic was set at 0.010 mg/L. The MCL for arsenic is 0.050 mg/L. Because arsenic is a common constituent of ground water in the Ohio River Valley for which naturally-occurring concentrations can exceed the cleanup goal presented in the ROD, the SOW specified that as part of the Remedial Design process, Ormet would conduct a statistical evaluation to determine the background level of arsenic in the alluvial aquifer. The resulting background level would then be considered for use as the cleanup goal in place of the level presented in the ROD. The results of the statistical analyses, which were presented to USEPA in the August 28, 1996 HydroSystems

Management, Inc. report titled, "Statistical Analyses of Background Levels of Manganese and Arsenic in Ground Water", indicated a background level of 40 ug/L for arsenic. At six of the compliance wells (MW-5, MW-12, MW-16, MW-28, MW-32, MW-35), the most recent results are below the 0.010 mg/L cleanup goal presented in the ROD; at MW-37, the most recent result is below the background value of 0.040 mg/L; and, at MW-31, the most recent result is below the MCL of 0.050 mg/L.

### **Beryllium**

Concentration versus time graphs for beryllium are provided in Appendix D-4. The cleanup goal for beryllium established in the ROD was the MCL, 0.004 mg/L. Beryllium was reported above the MCL only in samples collected during the Phase I RI (June/July 1988) and only at two wells: MW-18 and MW-37. Since the Phase I RI, beryllium has been consistently below the MCL in all samples analyzed, including samples from all of the compliance point monitoring wells during the May 1997 baseline monitoring event and the May and September 1998 routine monitoring events. At the MW-31 well, data for the past four sampling events show an increasing trend, but the most recent value (0.0014 mg/L) is still below the MCL.

### **Manganese**

Concentration versus time graphs for manganese are provided in Appendix D-5. Analytical results for manganese exhibit a decreasing trend for three of the compliance wells, MW-2, MW-5, and MW-37. Manganese results for MW-12 show a slight increasing trend. At MW-16, MW-32, MW-35, and MW-36, and possibly MW-31, manganese levels show an increasing trend during more recent monitoring events.

As discussed for arsenic, the final cleanup goal for manganese is pending. In the ROD, the cleanup goal for manganese was set at 0.230 mg/L. Because manganese is a common constituent of ground-water in the Ohio River Valley for which naturally-occurring concentrations can be well

above the cleanup goal presented in the ROD, the SOW specified that as part of the remedial Design process, Ormet would conduct a statistical evaluation to determine the background level of manganese in the alluvial aquifer. The resulting background level would then be considered for use as the cleanup goal in place of the level presented in the ROD. The results of the statistical analyses, which were presented to USEPA in the August 28, 1996 HydroSystems Management, Inc. report titled, "Statistical Analyses of Background Levels of Manganese and Arsenic in Ground Water", indicated a background level of 9,780 ug/L for manganese.

At MW-5 and MW-28, the most recent results for manganese are below the 0.230 mg/L cleanup goal presented in the ROD. Manganese concentrations were below the background level in all of the compliance wells during the May 1997 baseline sampling event and during each of the 1998 monitoring events.

### **Vanadium**

Concentration versus time graphs for vanadium are provided in Appendix D-6. The cleanup goal for vanadium established in the ROD was 0.260 mg/L. As with beryllium, vanadium was reported at or above the cleanup goal only in samples collected during the Phase I RI (June/July 1988) and only at two wells: MW-2 and MW-37. Since the Phase I RI, vanadium has been consistently below the cleanup goal in all samples analyzed, including samples from all of the compliance point monitoring wells during the May 1997 baseline monitoring event and the May and September 1998 routine monitoring events.

### **Tetrachloroethene (PCE)**

Under the RA Ground-Water Monitoring Plan, analyses for tetrachloroethene (PCE) were performed on samples from five of the compliance wells where PCE was detected during the RI, MW-2, MW-5, MW-18, MW-30, and MW-31. A graph showing PCE concentrations versus time for these five wells is provided as Appendix D-7. Since the Phase I RI, PCE concentrations have

shown a decline at MW-2, MW-5, and MW-31; PCE levels have increased at MW-30. The cleanup goal for PCE is the MCL of 0.005 mg/L. The most recent results for PCE were at or below the MCL (also the detection limit) at MW-2 and MW-5. Of the five wells monitored for PCE, MW-2 and MW-5 are the two most downgradient, indicating a decrease in the area of the aquifer affected by PCE.

### **Contaminant Mass-in-Place**

In accordance with Section II.3.C. of the Consent Decree SOW, data from the May 1997 baseline monitoring event and the May 1998 expanded routine monitoring event were used to estimate the masses of fluoride and cyanide (the primary plume indicators) in the alluvial aquifer as a means of evaluating the progress of the remediation. The procedure used for estimating the mass-in-place was as described in the RD Work Plan and the HydroSystems Management, Inc. (HMI) report titled, *Estimation of Dissolved Contaminant Mass in the Alluvial Aquifer, Ormet Primary Aluminum Corporation Superfund Site, Hannibal, Ohio* (August 28, 1996) that was submitted to the USEPA in conjunction with the 30% RD submittal. The approach used for estimation of contaminant mass-in-place is based on methods described in *Methods for Monitoring Pump-and-Treat Performance* (USEPA, July 1994). Results of the mass-in-place estimates for fluoride and cyanide are summarized in Table 5. For comparison, Table 5 also includes fluoride and cyanide mass-in-place estimates based on data from ground-water sampling conducted during the Phase I RI (June 1988) and on data from ground-water sampling conducted during January 1995. The mass-in-place estimates are based on the fluoride and total cyanide isopleth maps shown in Figures 5 through 12. Data and supporting calculations for the May 1997 and May 1998 mass-in-place estimates are provided in Appendix E. Data and supporting calculations for the 1988 and 1995 mass-in-place estimates were submitted to the USEPA in the August 1996 HMI report.

Based on the estimates presented in Table 5, the masses of fluoride and cyanide in the alluvial aquifer declined substantially during the period from June 1988 through May 1998. During this 10-year period, the estimated mass of fluoride in the alluvial aquifer declined approximately



72% (85,702 lbs. to 23,888 lbs.) and the estimated mass of cyanide declined approximately 62% (6,821 lbs. to 2,597 lbs.).

To assess the extent to which cyanide and fluoride continue to leach from soil in the FSPSA, the masses of fluoride and cyanide removed from the aquifer through pumping of the interceptor wells and Ranney well for the period between the two most recent expanded monitoring events (i.e., May 1997 through May 1998) were calculated and compared to the reductions in the estimated masses in the aquifer. The masses of cyanide and fluoride removed through pumping of the interceptor wells were calculated using daily analytical and flow data for the influent to Ormet's ground-water treatment plant, which receives the water pumped by the interceptor wells. The masses of cyanide and fluoride removed through pumping of the Reduction Mill Ranney well was calculated using quarterly analytical data and daily flow data collected by Ormet for NPDES reporting purposes.

During the period from May 1997 to May 1998, approximately 26,380 pounds of fluoride and approximately 3,625 pounds of cyanide (total) were removed from the alluvial aquifer by the interceptor wells and Ranney well. During the same period, the estimated mass of fluoride in the aquifer decreased by approximately 5,145 pounds and the estimated mass of cyanide decreased by approximately 346 pounds. That the masses of fluoride and total cyanide removed through pumping exceeded the mass-in-place decreases during the same period is attributed to continued leaching of fluoride and cyanide from the residual spent potliner material in the soil in the FSPSA. The purpose of soil flushing in the FSPSA is to accelerate the rate at which contaminants are leached from the source area soils and subsequently removed from the aquifer and treated.

#### **Aquifer Area Above Cleanup Goals**

As a further check of the progress of the remediation, the approximate areas of the aquifer containing fluoride and cyanide at concentrations above their respective cleanup goals were estimated using analytical results from the Phase I RI (June-July, 1988) and the January 1995, May

1997, and May 1998 sampling events. The results are summarized in Table 5. The estimates of aquifer areas above the cleanup goal are based on the fluoride and amenable cyanide isopleth maps shown in Figures 5 through 8 and Figures 13 through 16, respectively.

The area of the alluvial aquifer containing fluoride above the cleanup goal increased slightly between 1988 (approximately 43 acres) and 1995 (approximately 48 acres). Since 1995, the area above the cleanup goal for fluoride has decreased about 24%, to approximately 37 acres.

The area of the aquifer with concentrations of amenable cyanide above the cleanup goal of 0.2 mg/L shows a substantially greater degree of variability than for fluoride. As discussed previously, analyses for amenable cyanide tend to be subject to a higher degree of variability than other plume indicators, such as total cyanide and fluoride. For these reasons, trends in the area of the aquifer with amenable cyanide above its cleanup goal tend to be less consistent and should be regarded in a long-term context. Overall, the area of the aquifer exceeding the cleanup goal for amenable cyanide has decreased during the period from 1988 to 1998. The area calculated using data from the 1988 Phase I RI was approximately 24.5 acres; the area calculated using data from the 1998 expanded sampling event was approximately 10.5 acres. This represents a decrease of about 57%.

### **SUMMARY/CONCLUSIONS**

- Pumping of Ranney well and interceptor wells continues to provide containment of the plume beneath the Ormet property and removes contaminant mass from the alluvial aquifer.
- Part-time operation of the soil flushing system had no discernable effect on ground-water flow patterns beneath the FSPSA, and the flow of ground water continues to be from the river to the aquifer.
- Pumping of the interceptor wells and Ranney well removed approximately 26,380 pounds of fluoride and approximately 3,625 pounds of cyanide from the alluvial aquifer during the period May 1997 to May 1998.
- During the same period, the estimated masses of fluoride and cyanide in the aquifer decreased by about 5,145 pounds (18%) and 346 pounds (12%), respectively.
- In the 10-year period between the Phase I RI (1988) and the May 1998 monitoring event, the estimated masses of fluoride and cyanide in the aquifer have decreased from 85,702 pounds to 23,888 pounds (72%) and from 6,821 pounds to 2,597 pounds (62%), respectively.
- The masses of cyanide and fluoride estimated to have been removed from the aquifer by pumping from May 1997 to May 1998 exceed the estimated mass decreases in the aquifer during the same time period. This is attributed to continued leaching of fluoride and cyanide from soils in the FSPSA.
- The goal of the soil flushing system in the FSPSA is to accelerate the rate at which contaminants are removed from the source area soils and subsequently removed from the aquifer and treated.

- The estimated area of the alluvial aquifer with fluoride concentrations above the cleanup goal set forth in the ROD decreased by approximately 24% from the time of the Phase I RI to May 1998 (43 acres to 37 acres).
- The estimated area of the aquifer with amenable cyanide concentrations above the cleanup goal set forth in the ROD decreased by approximately 57% from the time of the Phase I RI to May 1998 (24.5 acres to 10.5 acres).
- Reductions in the area of the plume in the alluvial aquifer and the contaminant mass-in-place occurred prior to the completion of Remedial Construction and full-time operation of the FSPSA soil flushing system. These improvements in site conditions are attributable to operational changes and remedial activities undertaken by Ormet prior to the Superfund project, including pumping of wells that intercept the plume, which has been ongoing since 1972, and discontinued use of the disposal ponds and the potliner storage area.

## TABLES

TABLE 1  
WATER-LEVEL ELEVATION DATA  
ORMET CORPORATION  
HANNIBAL, OHIO  
DATE: MAY 5, 1997

Page 1 of 2

WATER-LEVEL MEASURING POINT	MEASURING POINT ELEVATION (ft. MSL)	DEPTH TO WATER (feet)	GROUND-WATER ELEVATION (ft. MSL)
MW-1	668.07	54.88	613.19
MW-2	668.12	57.99	610.13
MW-3	645.17	29.53	615.64
MW-4	661.07	59.55	601.52
MW-5	668.16	65.30	602.86
MW-7	667.94	60.18	607.76
MW-8	667.71	71.56	596.15
MW-9	666.59	69.76	596.83
MW-10	667.16	71.40	595.76
MW-11	667.31	65.14	602.17
MW-12	636.73	23.30	613.43
MW-13	661.44	41.96	619.48
MW-14	653.59	38.03	615.56
MW-15	657.31	37.75	619.56
MW-16	662.72	48.99	613.73
MW-17	655.03	37.50	617.53
MW-18	660.91	39.84	621.07
MW-19	662.03	41.50	620.53
MW-20	632.33	12.08	620.25
MW-21s	664.02	66.80	597.22
MW-21d	663.60	66.39	597.21
MW-22s	667.47	70.53	596.94
MW-22d	667.21	70.28	596.93
MW-23s	663.18	65.66	597.52
MW-23d	663.41	66.01	597.40
MW-24s	667.88	71.59	596.29
MW-24d	667.75	71.48	596.27
MW-25	667.73	65.21	602.52
MW-26s	665.54	68.91	596.63
MW-26d	665.59	69.03	596.56
MW-27	667.86	67.04	600.82
MW-28	663.27	20.56	642.71
MW-29s	653.40	40.10	613.30
MW-29d	653.07	39.70	613.37
MW-30	667.58	49.02	618.56
MW-31	661.59	46.92	614.67
MW-32	656.66	40.10	616.56
MW-33s	653.24	A	
MW-33d	653.22	A	
MW-34s	655.67	36.72	618.95
MW-34d	654.67	35.67	619.00
MW-35	661.90	36.37	625.53
MW-36	655.14	36.52	618.62
MW-37	661.14	19.40	641.74
MW-38	666.64	19.98	646.66
MW-39s	657.30	41.10	616.20
MW-39d	657.18	40.82	616.36
MW-40s	662.22	51.97	610.25
MW-40d	661.95	51.77	610.18
MW-41	637.67	13.50	624.17
MW-42s	654.37	40.04	614.33
MW-42d	654.34	39.93	614.41
MW-43s	633.68	A	
MW-43d	633.12	A	
MW-44s	662.01	52.15	609.86
MW-44d	661.76	52.68	609.08

TABLE 1 (CONT.)  
 WATER-LEVEL ELEVATION DATA  
 ORMET CORPORATION  
 HANNIBAL, OHIO  
 DATE: MAY 5, 1997

WATER-LEVEL MEASURING POINT	MEASURING POINT ELEVATION (ft. MSL)	DEPTH TO WATER (feet)	GROUND-WATER ELEVATION (ft. MSL)
PPB-01*	663.24	17.10	646.14
PPB-02s*	663.14	17.49	645.65
PPB-02d+	662.78	43.22	619.56
PPB-04+	661.57	45.49	616.08
PPB-05*	661.62	17.30	644.32
PPB-06+	663.04	45.33	617.71
PPB-07*	661.71	Not Found	-
PPB-09+	664.30	43.58	620.72
PPB-10*	663.45	12.52	650.93
PPB-14*	660.64	33.16	627.48
TH-3	667.81	59.11	608.70
TH-10	658.17	37.97	620.20
TH-11	659.08	36.73	622.35
TH-15	663.62	67.16	596.46
TH-16	664.62	67.48	597.14
TH-17	663.93	66.60	597.33
RP-1	643.17	19.00	624.17
RP-2	643.05	19.27	623.78

## NOTE:

All MW-series wells are measured from the top of the PVC casing.

All TH-series wells are measured from the top of steel casing.

River pool (RP) measuring points are located on the walkway below the dry scrubbers.

East INT & WEST INT refer to the old interceptor wells near the Ormet Ranney well.

\* - Designates a perched zone piezometer

+ - Designates an alluvial aquifer piezometer.

A - Wells abandoned April 1997

98-13MG

TABLE 2  
WATER-LEVEL ELEVATION DATA  
ORMET CORPORATION  
HANNIBAL, OHIO  
DATE: April 17, 1998

WATER-LEVEL MEASURING POINT	MEASURING POINT ELEVATION (ft. MSL)	DEPTH TO WATER (feet)	GROUND-WATER ELEVATION (ft. MSL)
MW-1	668.07	55.39	612.68
MW-2	668.12	58.99	609.13
MW-3	645.17	30.31	614.86
MW-4	661.07	61.69	599.38
MW-5	668.16	67.25	600.91
MW-7	667.94	61.05	606.89
MW-8	667.71	74.40	593.31
MW-9	666.59	73.53	593.06
MW-10	667.16	74.64	592.52
MW-11	667.31	67.19	600.12
MW-12	636.73	24.09	612.64
MW-13	661.44	42.23	619.21
MW-14	653.59	38.65	614.94
MW-15	657.31	38.13	619.18
MW-16	662.72	49.74	612.98
MW-17	655.03	37.99	617.04
MW-18	660.91	40.19	620.72
MW-19	662.03	41.78	620.25
MW-20	632.33	12.14	620.19
MW-21s	664.02	70.92	593.10
MW-21d	663.60	70.51	593.09
MW-22s	667.47	74.36	593.11
MW-22d	667.21	74.13	593.08
MW-23s	663.18	69.93	593.25
MW-23d	663.41	70.28	593.13
MW-24s	667.88	75.04	592.84
MW-24d	667.75	74.93	592.82
MW-25	667.73	66.68	601.05
MW-26s	665.54	72.51	593.03
MW-26d	665.59	72.67	592.92
MW-27	667.86	68.80	599.06
MW-28	663.27	22.26	641.01
MW-29s	653.40	40.86	612.54
MW-29d	653.07	40.47	612.60
MW-30	667.58	49.52	618.06
MW-31	661.59	47.68	613.91
MW-32	656.66	40.68	615.98
MW-34s	655.67	37.12	618.55
MW-34d	654.67	36.07	618.60
MW-35	661.90	36.62	625.28
MW-36	655.14	Not Found	--
MW-37	661.14	20.87	640.27
MW-38	666.64	20.42	646.22
MW-39s	657.30	41.68	615.62
MW-39d	657.18	41.35	615.83
MW-40s	662.22	52.93	609.29
MW-40d	661.95	52.75	609.20
MW-41	637.67	12.99	624.68
MW-42s	654.37	40.74	613.63
MW-42d	654.34	40.61	613.73
MW-44s	662.01	53.18	608.83
MW-44d	661.76	53.72	608.04



TABLE 2 (CONT.)  
 WATER-LEVEL ELEVATION DATA  
 ORMET CORPORATION  
 HANNIBAL, OHIO  
 DATE: April 17, 1998

WATER-LEVEL MEASURING POINT	MEASURING POINT ELEVATION (ft. MSL)	DEPTH TO WATER (feet)	GROUND-WATER ELEVATION (ft. MSL)
PPB-01*	663.24	18.64	644.60
PPB-02s*	663.14	17.51	645.63
PPB-02d+	662.78	43.57	619.21
PPB-04+	661.57	46.09	615.48
PPB-05*	661.62	18.84	642.78
PPB-06+	663.04	Buried	--
PPB-07*	661.71	Not Found	--
PPB-09+	664.30	43.59	620.71
PPB-10*	663.45	13.88	649.57
PPB-14*	660.64	Dry	--
TH-3	667.81	60.24	607.57
TH-10	658.17	38.36	619.81
TH-11	659.08	37.14	621.94
TH-15	663.62	70.62	593.00
TH-16	664.62	71.50	593.12
TH-17	663.93	70.78	593.15
RP-1	643.17	18.72	624.45
RP-2	643.05	18.89	624.16

## NOTE:

All MW-series wells are measured from the top of the PVC casing.

All TH-series wells are measured from the top of steel casing.

River pool (RP) measuring points are located on the walkway below the dry scrubbers.

\* - Designates a perched zone piezometer

+ - Designates an alluvial aquifer piezometer.

98-2.123

TABLE 3  
WATER-LEVEL ELEVATION DATA  
ORMET CORPORATION  
HANNIBAL, OHIO  
DATE: August 31, 1998

Page 1 of 2

WATER-LEVEL MEASURING POINT	MEASURING POINT ELEVATION (ft. MSL)	DEPTH TO WATER (feet)	GROUND-WATER ELEVATION (ft. MSL)
MW-1	668.07	54.66	613.41
MW-2	668.12	57.39	610.73
MW-3	645.17	28.94	616.23
MW-4	661.07	58.82	602.25
MW-5	668.16	64.59	603.57
MW-7	667.94	59.91	608.03
MW-8	667.71	71.30	596.41
MW-9	666.59	69.45	597.14
MW-10	667.16	71.20	595.96
MW-11	667.31	64.46	602.85
MW-12	636.73	22.68	614.05
MW-13	661.44	41.52	619.92
MW-14	653.59	37.42	616.17
MW-15	657.31	37.46	619.85
MW-16	662.72	48.42	614.30
MW-17	655.03	37.08	617.95
MW-18	660.91	39.85	621.06
MW-19	662.03	41.37	620.66
MW-20	632.33	11.80	620.53
MW-21s	664.02	66.43	597.59
MW-21d	663.60	66.02	597.58
MW-22s	667.47	70.21	597.26
MW-22d	667.21	69.98	597.23
MW-23s	663.18	65.33	597.85
MW-23d	663.41	65.69	597.72
MW-24s	667.88	71.34	596.54
MW-24d	667.75	71.23	596.52
MW-25	667.73	65.37	602.36
MW-26s	665.54	68.63	596.91
MW-26d	665.59	68.74	596.85
MW-27	667.86	66.97	600.89
MW-28	663.27	21.06	642.21
MW-29s	653.40	39.50	613.90
MW-29d	653.07	39.11	613.96
MW-30	667.58	48.93	618.65
MW-31	661.59	46.40	615.19
MW-32	656.66	39.48	617.18
MW-34s	655.67	37.24	618.43
MW-34d	654.67	35.33	619.34
MW-35	661.90	36.31	625.59
MW-36	655.14	37.71	617.43
MW-37	661.14	19.31	641.83
MW-38	666.64	20.18	646.46
MW-39s	657.30	40.61	616.69
MW-39d	657.18	40.33	616.85
MW-40s	662.22	51.30	610.92
MW-40d	661.95	51.10	610.85
MW-41	637.67	13.33	624.34
MW-42s	654.37	39.51	614.86
MW-42d	654.34	39.39	614.95
MW-44s	662.01	51.40	610.61
MW-44d	661.76	51.89	609.87

TABLE 3 (CONT.)  
WATER-LEVEL ELEVATION DATA  
ORMET CORPORATION  
HANNIBAL, OHIO  
DATE: August 31, 1998

WATER-LEVEL MEASURING POINT	MEASURING POINT ELEVATION (ft. MSL)	DEPTH TO WATER (feet)	GROUND-WATER ELEVATION (ft. MSL)
PPB-01*	663.24	19.27	643.97
PPB-02s*	663.14	17.63	645.51
PPB-02d+	662.78	43.02	619.76
PPB-04+	661.57	45.02	616.55
PPB-05*	661.62	18.78	642.84
PPB-06+	663.04	47.05	615.99
PPB-07*	661.71	Not Found	--
PPB-09+	664.30	43.17	621.13
PPB-10*	663.45	14.42	649.03
PPB-14*	660.64	Dry/33.55	<627.09
TH-3	667.81	58.38	609.43
TH-10	658.17	37.78	620.39
TH-11	659.08	36.52	622.56
TH-15	663.62	66.86	596.76
TH-16	664.62	67.12	597.50
TH-17	663.93	66.25	597.68
RP-1	643.17	18.79	624.38
RP-2	643.05	19.04	624.01

## NOTE:

All MW-series wells are measured from the top of the PVC casing.

All TH-series wells are measured from the top of steel casing.

River pool (RP) measuring points are located on the walkway below the dry scrubbers.

\* - Designates a perched zone piezometer

+ - Designates an alluvial aquifer piezometer.

98-3.123

TABLE 4  
SUMMARY OF ANALYTICAL RESULTS FOR REMEDIAL ACTION  
GROUND-WATER MONITORING WELLS AND PARAMETERS

ORMET CORPORATION  
HANNIBAL, OHIO

	pH (lab)	pH (field)	Specific Conductance (lab)	Specific Conductance (field)	Cyanide Total	Cyanide Free	Cyanide Amenable	Fluoride	Arsenic	Beryllium	Iron	Manganese	Sodium	Vanadium	Tetrachloroethene
<b>MW-1</b>															
12/83	6.4	6.0	270	210	0.018	0.014		0.1			0.04	0.65	14.2		
2/84	6.1	6.1	270	215	0.04	0.1		0.1			0.01	0.54	14.9		
9/84	6.1	5.7	195	210	<0.01	<0.01		<0.2			0.02	0.33	13.8		
5/85	6.4	6.0	200	210	0.13	0.13		<0.2			0.04	0.15	16.2		
6/88	6.2	6.4	670	540	<0.01	<0.01	<0.01	0.2	0.0024	<0.0015	6.21	0.379	20.3	0.006	
1/95	6.2	4.7	370	550	0.02		<0.01	0.1	<0.004	<0.0005	<0.04	0.39	21	<0.01	
5/97	5.9	6.32	470	365	<0.01		<0.01	0.1	<0.004	<0.0005		0.13	19	<0.01	
5/98	6.01	5.65	480	505	<0.01			0.20	<0.004	<0.0005		0.10	20	<0.01	
<b>MW-2</b>															
12/83	10.3	10.3	6,000	6,000	56.0	0.27		400			55.2	1.98	1,950		
2/84	10.3	10.3	7,752	2,750	48.0			420			58	2.46	2,290		
9/84	10.5	9.9	6,308	6,900	40.8	0.095		480			59.3	2.1	2,460		
5/85	10.4	10.4	13,200	5,800	95	0.10		400			54.0	1.74	2,150		
10/85	10.5		7,100		140	12		390		<0.01	54.0	1.82	2,060		
7/88	10.4	10.4	6,200	6,000	22		12	330	0.394	<0.0015	34.2	1.00	1,450	0.251	0.011
2/90	10.34	10.2	4,800	3,900	36.2		29.6	200			31.0		1,200		
1/95	10.0	9.6	2,400	>2,000	7.1	<0.01	<0.01	93	0.085	<0.01	8.6	0.82	520	0.09	
5/97	10.1	10.07	2,100	1,865	17		<1.0	63	0.092	0.001		1	470	0.06	0.008
5/98	9.98	10.24	1,900	1,880	13		<0.01	68	0.082	0.001		0.93	450	0.06	0.0053
9/98	9.96	9.96	1,900	1,991	21		0.30	69	0.086	0.00089		0.90	440	0.051	<0.005
<b>MW-5</b>															
12/83	9.7	9.5	3,058	2,825	18.8	0.064		130			17.5	1.61	880		
2/84	9.6	9.6	3,636	2,700	14.5			120			18.0	1.39	1,030		
9/84	9.8	9.3	2,278	3,100	4.94	0.032		140			19.4	1.7	850		
5/85	9.8	9.9	4,800	2,400	25.0	0.037		91			15.8	1.01	710		
10/85	9.8		2,550		22.0	2.0		70		<0.01	13.0	0.93	650		
7/88	9.5	9.6	2,000	2,050	5.5		0.10	90	0.076	<0.0015	7.05	0.514	449	0.025	0.012
1/95	8.6	8.5	1,500	1,250	3.1		<0.01	32	0.008	<0.01	1.3	0.27	270	<0.01	
5/97	9.0	9.2	1,500	1,318	3.5		<0.25	16	0.015	<0.0005		0.4	310	<0.01	<0.005
5/98	8.83	8.84	1,400	1,340	2.1		<0.01	18	0.007	<0.0005		0.17	300	<0.01	<0.005
5/98 (DUP)	8.83	8.84	1,400	1,340	1.3		<0.01	18	0.007	<0.0005		0.18	300	<0.01	<0.005
9/98	8.92	8.66	1,200	1,219	2.0		0.02	18	0.0089	<0.0005		0.16	240	<0.01	<0.005
<b>MW-7</b>															
12/83	6.8	6.2	613	700	0.019	0.020		0.1			1.01	7.88	49.0		
2/84	5.9	5.9	581	750	<0.01			0.1			9.0	4.72	49.2		
9/84	5.8	5.7	410	680	<0.01	<0.01		<0.2			11.6	4.65	58.0		
5/85	6.1	5.6	720	890	0.023	0.021		<0.2			24.7	3.70	61.0		
6/88	5.7	5.8	740	760	0.02		0.01	0.2	0.012	<0.0015	17.6	3.05	64.2	0.0032	
1/95	5.5	5.3	850	1,500	<0.01		<0.01	0.2	0.040	<0.0005	22	2.3	72	<0.01	
5/97	5.6	6.04	790	670	<0.01			0.10	0.038	<0.0005		2.2	89	<0.01	
5/97 (DUP)	5.7		800	670	<0.01			0.20	0.038	<0.0005		2.2	84	<0.01	
5/98	5.71	5.69	770	900	<0.01			0.20	0.051	<0.0005		2.2	78	<0.01	

Note: All results in mg/L unless otherwise noted.

TABLE 4 (CONT.)  
SUMMARY OF ANALYTICAL RESULTS FOR REMEDIAL ACTION  
GROUND-WATER MONITORING WELLS AND PARAMETERS

ORMET CORPORATION  
HANNIBAL, OHIO

	pH (lab)	pH (field)	Specific Conductance (lab)	Specific Conductance (field)	Cyanide Total	Cyanide Free	Cyanide Amenable	Fluoride	Arsenic	Beryllium	Iron	Manganese	Sodium	Vanadium	Tetrachloroethene
<b>MW-8</b>															
12/83	9.5	9.2	820	700	0.32	0.017		18			0.20	0.01	202		
2/84	9.5	9.5	820	700	0.14			18			0.23	0.04	199		
9/84	9.5	9.0	661	800	0.35	0.013		22			1.00	0.04	216		
5/85	9.2	9.2	830	550	0.11	0.024		7.9			0.21	0.01	151		
5/86	8.8		550		0.04						<0.01	<0.01	111		
6/88	8.4	8.3	560	550	0.06		<0.01	2.8	0.0018	<0.0015	0.044	0.023	67.8	<0.0026	<0.005
1/95	7.8	7.8	610	930	0.09		<0.01	3.1	<0.004	<0.01	<0.04	0.08	50	<0.01	
5/97	7.8	8.02	560	442	0.040		<0.01	2.2	<0.004	<0.0005		0.12	44	<0.01	
5/98	7.81	7.60	490	514	0.02		<0.01	2.3	<0.004	<0.0005		0.14	30	<0.01	
<b>MW-10</b>															
12/83	7.7	7.6	1,205	1,280	1.36	0.083		6.9			0.60	0.26	195		
2/84	7.6	7.5	820	800	0.79			5.5			0.30	0.26	106		
9/84	7.6	6.5	547	675	0.22	0.14		4.3			0.13	0.34	88		
5/85	7.7	7.0	800	710	0.33	0.060		2.9			0.07	0.05	53		
6/88	7.3	7.2	770	750	<0.01		<0.01	2.1	0.0038	<0.0015	0.081	<0.001	28.7	<0.0026	
1/95	7.0	6.8	800	560	0.02		0.02	0.5	<0.004	<0.01	<0.04	<0.01	26	<0.01	
5/97	7.2	7.4	670	510	<0.01			0.70	<0.004	<0.0005		<0.01	25	<0.01	
5/98	7.22	7.23	970	1,110	0.15		0.01	0.60	<0.008	<0.0005		<0.01	120	<0.01	
<b>MW-11</b>															
12/83	9.6	9.4	980	825	0.52	0.021		33			0.48	0.06	238		
2/84	9.6	9.5	962	775	0.25			27			7.9	0.37	232		
9/84	9.7	9.1	656	800	0.20	0.015		22			4.90	0.21	213		
5/85	9.4	9.5	750	650	0.30	0.026		13			2.68	0.13	181		
6/88	8.5	8.4	570	565	0.12		<0.01	4.9	0.0043	<0.0015	0.071	0.227	78.5	<0.0026	<0.005
1/95	7.6	7.9	540	680	0.02		<0.01	2.3	<0.004	<0.01	<0.04	0.40	30	<0.01	
5/97	7.8	7.64	530	404	0.09		<0.01	1.8	<0.004	<0.0005		0.42	33	<0.01	
5/98	7.84	7.57	490	507	0.02		<0.01	1.7	<0.004	<0.0005		0.45	31	<0.01	
5/98 (DUP)	7.85	7.57	500	507	0.02		<0.01	1.7	<0.004	<0.0005		0.43	29	<0.01	
<b>MW-12</b>															
12/83	7.5	7.3	476	400	0.074	0.021		2.1			<0.01	0.94	24.3		
2/84	7.5	7.2	476	385	0.02			2.0			0.02	0.71	23.8		
9/84	7.7	6.3	366	375	<0.01	<0.01		2.2			<0.01	0.61	29.0		
5/85	7.7	7.4	540	390	0.024	0.022		1.6			<0.01	1.00	27.7		
5/86	7.5		494		<0.01						<0.01	1.23	27		
6/88	7.2	7.5	510	515	<0.01		<0.01	1.3	<0.0015	<0.0015	0.066	1.09	24.4	<0.0026	<0.005
1/95	7.4	7.6	530	350	<0.01		<0.01	1.1	<0.004	<0.01	<0.04	1.5	23	<0.01	
5/97	7.5	7.7	540	422	<0.01			0.90	<0.004	<0.0005		1.7	19	<0.01	
5/98	7.43	7.43	470	550	<0.01			0.80	<0.008	<0.0005		1.9	23	<0.01	
9/98	7.57	7.38	470	481	<0.01			0.92	<0.004	<0.0005		1.6	20	<0.01	

Note: All results in mg/L unless otherwise noted.

TABLE 4 (CONT.)  
SUMMARY OF ANALYTICAL RESULTS FOR REMEDIAL ACTION  
GROUND-WATER MONITORING WELLS AND PARAMETERS

ORMET CORPORATION  
HANNIBAL, OHIO

	pH (lab)	pH (field)	Specific Conductance (lab)	Specific Conductance (field)	Cyanide Total	Cyanide Free	Cyanide Amenable	Fluoride	Arsenic	Beryllium	Iron	Manganese	Sodium	Vanadium	Tetrachloroethene
MW-15 12/83 2/84 5/85 5/86 7/88 1/95 7/96 5/97 5/97 (DUP) 5/98	6.9	6.7	568	435	0.44	0.018	0.10/<0.01	0.1	0.0045	0.0025	0.14	0.03	28.8	0.0059	<0.005
	6.9	6.7	550	435	0.51	0.034	0.12	0.1	<0.004	<0.01	0.13	<0.01	29.4	<0.01	
	7.4	6.8	590	445	0.44			0.3			0.18	<0.01	32.5	<0.01	
	7.1		550		0.39						0.15	<0.01	34		
	7.07/1	7.17/1	610/630	600/600	0.43/0.32			0.2/0.2	0.0045	0.0025	10.8	0.117	34.4	0.0059	
	7.1	7.1	720	420	0.49		0.12	1.4	<0.004	<0.01	0.26	<0.01	45	<0.01	
	6.8	7.07	570	613	1.0	<0.020	0.20	2.1	<0.004	<0.0005		<0.01		<0.01	
	7.4	7.44	800	731	2.8		0.40	11	<0.004	<0.0005		0.02	140	<0.01	
	7.4	7.44	800	731	3.3		0.02	8.9	<0.004	<0.0005		0.05	140	<0.01	
	6.99	6.78	610	625	0.49			0.40	<0.004	<0.0005		<0.01	40	<0.01	
MW-16 12/83 2/84 9/84 5/85 10/85 7/88 1/95 7/96 5/97 5/98 9/98	9.8	9.9	2,092	1,800	7.35	0.034		110	0.063	<0.0015	12.4	0.91	530	0.018	0.006
	9.7	9.7	2,049	1,550	5.5		0.13	98	<0.004	<0.01	13.9	1.41	570	<0.01	
	9.8	9.2	1,390	10,500	2.11	<0.01		80	<0.004	<0.0005	9.5	0.5	475	<0.01	
	9.4	9.0	2,300	1,400	10.0	0.11		72			10.3	1.09	443	<0.01	
	8.4		1,540		3.9	0.0		30		<0.01	2.10	0.41	186		
	9.4	9.7	1,400	1,410	4.6		<0.01	61	0.063	<0.0015	6.57	0.22	300	0.018	
	7.7	9.0	850	930	1.4		0.13	7.9	<0.004	<0.01	0.52	1.1	81	<0.01	
	7.3	7.75	990	941	1.6	<0.020	0.3	7.9	<0.004	<0.0005		1		<0.01	
	7.6	7.6	980	801	1.3		0.40	11	<0.004	<0.0005		0.43	130	<0.01	
	7.72	7.70	750	760	2.0		1.4	11	<0.004	<0.0005		1.2	80	<0.01	
MW-17 12/83 2/84 9/84 5/85 10/85 6/88 2/90 1/95 5/97 5/98	7.70	7.50	860	790	1.4			9.5	<0.004	<0.0005		1.3	75	<0.01	<0.005
	7.9	7.6	613	475	0.99	0.021		5.6			0.44	1.38	78		
	7.6	7.4	581	470	1.03			4.4			0.39	1.77	52		
	8.0	6.7	485	550	0.17	<0.01		9.1			0.28	1.27	99		
	7.9	7.9	610	470	0.76	0.045		4.1		<0.01	0.28	1.80	45.3		
	7.9		564		0.56	0.43		4.2	0.0054	<0.0015	6.80	1.93	43.4		
	7.7	7.5	590	475	1.3		0.46	5.2		<0.0015	0.973	1.72	39.7	<0.0026	
	7.7	7.55	680	640	0.582		<0.005	4.1			18		40		
	7.5	7.7	710	420	0.64		<0.01	3.9	<0.004	<0.01	0.26	1.9	36	<0.01	
	7.5	7.67	870	488	0.54		<0.01	3.1	<0.004	<0.0005		1.9	30	<0.01	
MW-18 12/83 2/84 9/84 5/85 10/85 7/88 2/90 1/95 7/96 5/97 5/98 9/98	7.6	7.40	570	580	0.72		0.09	3.4	<0.004	<0.0005		1.8	34	<0.01	0.022
	9.9	10.0	10,526	8,750	110.0	0.45		460			58.7	0.26	3,150	0.191	
	9.8	9.8	9,615	7,500	52.0			350			61	0.50	2,750	0.02	
	10.1	9.5	9,111	10,000	194	0.19		690			103	0.3	4,130	0.01	
	9.8	9.9		7,000	35.2	0.091		410		<0.01	64.2	0.35	2,540	0.02	
	9.9		6,300		120	12		350	0.159	0.0071	71.4	1.06	1,940	0.05	
	10.0	10.1	9,700	10,000	29		25	820			144	1.75	2,640	0.022	
	10.0	10.1	8,000	11,400	67.0		10.5	710		<0.01	110	0.22	3,500	0.02	
	9.6	11.1	5,900	>2,000	15		6.6	290	0.062	<0.01	56	0.22	1,500	0.01	
	9.1	8.67	4,300	4,200	7.2			180	0.065	0.0006	56	0.19	1,500	0.01	
5/97 5/98 9/98	9.7	9.58	4,000	4,110	8.7	<0.020	<0.50	200	0.078	0.0009		0.29	1,100	0.02	0.024
	9.76	10.06	4200	4,300	9.8		0.40	260	0.094	0.0014		0.49	1100	0.05	
	9.70	9.88	3,600	3,590	5.9		<0.01	210	0.085	0.00084		0.29	800	0.022	

Note: All results in mg/L unless otherwise noted.

TABLE 4 (CONT.)  
SUMMARY OF ANALYTICAL RESULTS FOR REMEDIAL ACTION  
GROUND-WATER MONITORING WELLS AND PARAMETERS

ORMET CORPORATION  
HANNIBAL, OHIO

	pH (lab)	pH (field)	Specific Conductance (lab)	Specific Conductance (field)	Cyanide Total	Cyanide Free	Cyanide Amenable	Fluoride	Arsenic	Beryllium	Iron	Manganese	Sodium	Vanadium	Tetrachloroethene
MW-19 12/83 2/84 9/84 5/85 7/88 2/90 1/95 5/97 5/98	7.2	7.1	581	435	0.068	0.013		0.3			<0.01	0.54	22.9		
	7.1	6.8	575	405	0.04			0.5			0.05	0.26	20.2		
	7.2	6.3	451	460	0.01	<0.01		0.4			0.02	0.04	23.5		
	7.6	7.0	640	460	0.019	0.014		0.5			0.12	0.02	23.6		
	7.3	7.3	630	600	<0.01		<0.01	0.5	0.0067	<0.0015	17.6	0.23	32.2	0.015	<0.005
	7.3	7.27	520	560	0.2		<0.005	0.7					21.0		
	7.3	7.2	630	410	<0.01		<0.01	1.0	<0.004	<0.01	0.09	<0.01	24	<0.01	
	7.4	7.5	520	431	<0.01		<0.01	2.0	<0.004	<0.0005		<0.01	18	<0.01	
	7.23	6.95	560	575	<0.01			1.4	<0.008	<0.0005		<0.01	23	<0.01	
MW-28 5/86 6/88 1/95 7/96 5/97 5/98 9/98 9/98 (DUP)	5.5		382		0.89	0.08		<0.1			0.36	0.02	41		
	5.7	5.8	640	665	7.4		0.6	<0.1	<0.0015	<0.0015	2.41	0.035	83.3	<0.0026	<0.005
	6.2	7.4	500	700	0.74		0.26	2.7	<0.004	<0.01	0.38	0.02	79	<0.01	
	5.7	5.92	440	429	0.26			0.50	<0.004	<0.0005		0.01		<0.01	
	5.6	6.4	590	453	0.11	<0.02		0.2	<0.004	<0.0005		0.01	62	<0.01	
	5.74	5.98	500	532	0.12	<0.01		0.20	<0.004	<0.0005		0.01	65	<0.01	
	5.81	5.28	540	527	0.11	0.11		0.27	<0.004	<0.0005		0.011	64	<0.01	
	5.83	5.28	540	527	0.11		0.11	0.24	<0.004	<0.0005		0.01	65	<0.01	
MW-29S 5/86 6/88 1/95 5/97 5/98	8.4		2,350		1.5	0.02		28			0.64	0.08	590		
	9.0	9.0	1,100	1,090	0.99		0.37	44	0.0052	<0.0015	1.52	0.094	224	0.0044	<0.005
	8.3	10.0	2,900	1,750	0.79		0.07	56	<0.004	<0.01	0.37	0.12	590		
	8.3	8.43	2,200	1,735	0.6		<0.1	44	<0.004	<0.0005		0.14	410	<0.01	
	8.64	8.70	1,700	1,665	0.18		<0.01	26	<0.004	<0.0005		0.09	370	<0.01	
MW-29D 5/86 6/88 1/95 5/97 5/98	8.6		648		0.31	0.01		9.7			0.18	0.26	139		
	8.1	8.0	590	570	0.25		<0.01	4.2	0.002	<0.0015	0.082	1.16	60.4	<0.0026	<0.005
	7.5	8.9	650	770	0.22		0.03	3.7	<0.004	<0.01	0.09	2.0	33	<0.01	
	7.7	7.9	600	479	0.18		<0.02	3.3	<0.004	<0.0005		2	31	<0.01	
	7.65	7.53	550	560	0.17		<0.01	3.5	<0.004	<0.0005		1.8	28	<0.01	
MW-30 5/86 6/88 1/95 5/97 5/98	6.6		342		0.01	<0.01		0.5			<0.01	2.10	20	0.0044	0.005
	6.3	6.3	340	400	0.01		<0.01	<0.1	0.0018	<0.0015	4.42	0.753	18.7	<0.01	
	6.2	6.0	430	570	0.01		<0.01	<0.1	<0.004	<0.01	0.78	0.60	19	<0.01	
	6.2	6.47	420	334	<0.01			<0.1	<0.004	<0.005		0.6	18	<0.01	0.012
	6.19	5.70	390	418	<0.01			0.10	<0.004	<0.0005		0.68	21	<0.01	0.013

Note: All results in mg/L unless otherwise noted.

TABLE 4 (CONT.)  
SUMMARY OF ANALYTICAL RESULTS FOR REMEDIAL ACTION  
GROUND-WATER MONITORING WELLS AND PARAMETERS

ORMET CORPORATION  
HANHIBAL, OHIO

	pH (lab)	pH (field)	Specific Conductance (lab)	Specific Conductance (field)	Cyanide Total	Cyanide Free	Cyanide Amenable	Fluoride	Arsenic	Beryllium	Iron	Manganese	Sodium	Vanadium	Tetrachloroethene
<b>MW-31</b>															
5/86	9.1		1,250		12	1.5	<0.01	46	0.046	<0.0015	84.5	3.67	380	0.184	0.040
6/88	10.2	10.5	3,400	3,500	39		3.94	140			20.3	1.93	703		
2/90	10.0	9.95	2,300	2,700	4.80		<0.01	110			49	0.66	660	<0.02	
1/95	9.6	10.4	1,900	1,600	7.1			89	0.027	<0.01	4.6	0.62	420	0.04	0.041
7/96	9.5	9.52	2,300	2,100	12	<0.020	<0.50	91	0.042	0.0007		0.68		0.05	0.028
5/97	9.9	9.69	2,500	2,100	12			110	0.04	0.0007		0.74	480	0.05	0.029
5/97 (DUP)	9.9	9.69	2,500	2,100	6.2			93	0.038	0.0008			480		
5/98	9.63	9.80	2,400	2,350	9.3		<0.01	100	0.036	0.0013		1.1	490	0.04	0.022
9/98	9.67	9.86	2,600	2,520	9.8		<0.01	120	0.044	0.0014		1.1	620	0.045	0.017
9/98 (DUP)	9.67	9.86	2,700	2,520	9.5		<0.01	130	0.045	0.0013		1.1	600	0.043	0.020
<b>MW-32</b>															
5/86	10.5		6,430		97	18	0.30	369	0.014	<0.0015	27.4	0.69	2120	0.024	<0.005
7/88	9.2	9.3	890	1,040	7.2		3.6	39	0.014	<0.0015	4.05	0.513	234	0.03	
1/95	9.4	9.4	1,300	630	12	<0.020		47	0.011	<0.0005	2.7	0.84	230	0.01	
7/96	8.6	8.89	1,000	1,038	6.9		1.3	29	0.008	<0.0005		1.1	110	<0.01	
5/97	8.7	8.71	930	697	4.4		0.34	19	<0.004	<0.0005		1.9	61	<0.01	
5/98	8.03	8.10	630	697	2.5		0.09	7.7	<0.004	<0.0005		2.0	68	<0.01	
5/98 (DUP)	8.05	8.10	690	697	2.5		1.0	8.0	<0.004	<0.0005		1.8	78	<0.01	
9/98	8.30	8.26	760	760	4.5			13	<0.004	<0.0005					
<b>MW-34S</b>															
5/86	7.4		668		0.13	<0.01	38	9.4	0.0087	<0.0015	0.07	0.42	64	0.018	<0.005
7/88	7.2	7.2	690	670	40		0.26	7.3			14.6	0.416	33.1		
2/90	7.4	6.93	690	740	0.113		<0.01	6.5	<0.004	<0.01	21	0.01	49	<0.01	
1/95	7.2	7.1	700	430	0.03		0.04	7.3	<0.004	<0.0005	0.18	0.04	35	<0.01	
5/97	7.4	7.43	710	579	0.18	NS	NS	8.1	<0.004	NS	NS	NS	69	NS	NS
5/98	NS	NS	NS	NS	NS			NS	NS				NS		
<b>MW-34D</b>															
5/86	7.3		602		0.05	<0.01	<0.01	10.2	0.0031	<0.0015	0.02	0.55	42	<0.0026	<0.005
7/88	7.4	7.4	560	580	0.07		0.07	4.4	<0.004	<0.01	0.538	0.762	32.4	<0.01	
1/95	7.3	7.4	640	400	0.07		<0.01	4.2	<0.004	<0.0005	<0.04	0.82	34	<0.01	
5/97	7.4	7.43	630	492	0.05		0.01	3.6	<0.004	<0.0005		0.79	31	<0.01	
5/98	7.37	7.23	590	595	0.09			3.9	<0.004	<0.0005		0.68	35	<0.01	
<b>MW-35</b>															
5/86	10.2		6,430		240	38	41	358	0.147	0.002	125	1.76	2,070	0.053	<0.005
7/88	10.2	10.4	6,100	6,150	43		<0.005	400			56.5	0.337	1,630		
2/90	9.6	9.7	1,500	1,540	8.0		<0.01	71	0.018	<0.01	20	0.43	350	<0.01	
1/95	9.5	9.7	1,200	582	16	0.040		35	0.028	0.0006	11	0.5	220	0.03	
7/96	9.5	9.5	1,700	1,851	6.0		<1.0	71	0.02	0.0006		0.68	220	0.02	
5/97	9.4	9.47	1,000	900	16		2.9	40	0.012	0.0005		0.92	140	0.01	
5/98	8.93	9.10	710	766	15		0.99	27	0.01	<0.0005		0.88	130	<0.01	
9/98	8.97	8.90	550	778	16			26	0.01	<0.0005					

Note: All results in mg/L unless otherwise noted.



TABLE 4 (CONT.)  
SUMMARY OF ANALYTICAL RESULTS FOR REMEDIAL ACTION  
GROUND-WATER MONITORING WELLS AND PARAMETERS

ORMET CORPORATION  
HANNIBAL, OHIO

	pH (lab)	pH (field)	Specific Conductance (lab)	Specific Conductance (field)	Cyanide Total	Cyanide Free	Cyanide Amenable	Fluoride	Arsenic	Beryllium	Iron	Manganese	Sodium	Vanadium	Tetrachloroethene
MW-36 5/86 7/88 1/95 7/96 5/97 5/98	9.7	9.6	2,700	1,255	25	1.4	1.3	97	0.0078	<0.0015	39.5	1.13	760	0.0063	<0.005
	8.9	9.7	940	1,350	8.6		<0.01	18	0.034	<0.01	3.52	0.332	161	0.07	
	9.8	9.5	3,500	3,280	18	<0.020		160	0.058	0.0021	8.7	0.67	770	0.07	
	9.6	9.64	3,300	3,290	8.1		3.5	180	0.084	0.0035	NS	1.7	850	0.1	NS
	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
MW-37 5/86 7/88 2/90 1/95 7/96 5/97 5/98	9.90	10.10	4,500	4,380	6.5		0.03	230	0.11	0.0036		1.4	990	0.074	
	10.1		7,340	5,500	97	8.2		890	0.169	0.035	498	46.3	1,800		
	9.9	9.8	5,600	3,100	0.30		<0.01	1000			115	15.4	1,470	0.369	<0.005
	9.6	9.65	2,700	970	4.6		22.7	360			1000		970		
	9.1	9.2	1,200	832	18	<0.020	<0.01	87	0.033	<0.01	8.5	0.58	280	0.01	
MW-39S 5/86 6/88 1/95 5/97 5/98	9.1	8.89	570	846	14		1.7	45	0.042	0.0005		0.51		0.03	
	9.2	9.07	1,100	505	13		<0.01	53	0.027	<0.0005		0.56	210	0.02	
	8.57	8.30	530	682	6.4		5.5	6.8	0.018	<0.0005		0.28	120	0.02	
	8.90	8.26	670		15			52	0.020	<0.0005		0.53	140	0.017	
MW-39D 5/86 6/88 1/95 5/97 5/98	9.5	9.1	8,360	2,550	11	2.9		244	0.016	<0.0015	25.0	1.35	2780	0.053	<0.005
	9.3	8.7	3,500	900	3.8		0.10	110	<0.004	<0.01	36.6	1.63	826	<0.01	
	8.9	9.2	2,700	5,500	0.64		<0.01	59	0.009	<0.0005	0.36	0.22	520	<0.01	
	8.9	9.09	5,500	4,000	3.6		<0.01	150	0.009	<0.0005		0.15	1300	<0.01	
	9.04		4000		2.3			98	0.009	<0.0005		0.11	700	<0.01	
MW-40S 5/86 6/88 1/95 5/97 5/98	8.1	7.8	627	595	0.21	0.02		7.4	0.0021	<0.0015	0.14	0.54	103	<0.0026	<0.005
	7.9	7.6	590	410	0.17		0.03	6.1	<0.004	<0.01	0.36	0.681	53.9	<0.01	
	7.5	7.66	630	457	0.07		<0.01	3.9	<0.004	<0.0005	0.06	0.87	36	<0.01	
	7.5	7.35	630	560	0.06		0.06	3.8	<0.004	<0.0005		0.87	32	<0.01	
	7.52		590		0.04		<0.01	3.6	<0.004	<0.0005		0.77	34	<0.01	
MW-40S 5/86 6/88 1/95 5/97 5/98	8.9	9.2	2,550	2,200	1.7	0.03		28	0.018	<0.0015	12.8	0.49	650	0.0056	<0.005
	9.2	7.9	2,100	1,600	1.5		<0.01	5.9	<0.004	<0.01	1.89	0.139	445	<0.01	
	7.9	8.07	2,500	1,417	0.87		<0.01	40	<0.004	<0.0005	0.36	0.33	470	<0.01	
	7.9	8.18	1,900	1,335	0.72		0.40	21	<0.004	<0.0005		0.66	380	<0.01	
	8.2		1400		0.36		<0.01	39	<0.004	<0.0005		0.13	270	<0.01	
MW-40D 5/86 6/88 1/95 5/97 5/98	9.4	9.4	1,120	1,290	7.4	0.06		20	0.018	<0.0015	11.7	0.62	280	0.012	<0.005
	9.4	7.7	1,200	1,375	7.0		<0.01	36	<0.004	<0.01	7.81	0.454	258	<0.01	
	7.6	7.9	2,000	1,350	0.70		<0.01	16	<0.004	<0.0005	0.29	0.74	340	<0.01	
	7.6	7.73	1,800	1,250	0.59		<0.1	7.6	<0.004	<0.0005		1.3	340	<0.01	
	7.85		1,300		0.49		0.47	19	<0.004	<0.0005		0.36	250	<0.01	
MW-41 1/95 5/97 5/98	6.6	8.2	490	600	0.04		0.02	0.2	0.017	<0.01	8.9	1.3	22	<0.01	
	6.8	6.98	490	357	<0.01			0.20	0.022	<0.0005		1.6	21	<0.01	
	6.67	6.74	420	449	<0.01			0.30	0.016	<0.0005		1.3	21	<0.01	

Note: All results in mg/L unless otherwise noted.

NS = Not sampled. Well damaged during remedial construction.

HydroSystems Management, Inc.

TABLE 4 (CONT.)  
SUMMARY OF ANALYTICAL RESULTS FOR REMEDIAL ACTION  
GROUND-WATER MONITORING WELLS AND PARAMETERS

ORMET CORPORATION  
HANNIBAL, OHIO

	pH (lab)	pH (field)	Specific Conductance (lab)	Specific Conductance (field)	Cyanide Total	Cyanide Free	Cyanide Amenable	Fluoride	Arsenic	Beryllium	Iron	Manganese	Sodium	Vanadium	Tetrachloroethene
<b>MW-42S</b>															
6/88	8.0	8.4	930	870	0.70		0.25	14.0	0.002	<0.0015	0.232	0.237	143	0.0027	<0.005
2/90	8.4	8.25	2,100	2,400	0.266		0.079	35.0			0.88		520		
1/95	8.2	8.4	1,600	765	0.45		<0.01	22	<0.004	<0.01	0.2	0.35	280	<0.01	
5/97	8.2	8.57	1,700	1,350	0.56		<0.02	29	<0.004	<0.0005		0.33	300	<0.01	
5/98	8.26	8.46	1,400	1,460	0.52		<0.01	27	<0.004	<0.0005		0.37	270	<0.01	
<b>MW-42D</b>															
6/88	7.9	8.1	550	600	0.16		<0.01	6.0	0.0028	<0.0015	1.11	0.636	68.6	0.0028	<0.005
1/95	7.5	7.7	640	410	0.04		<0.01	3.6	<0.004	<0.01	0.08	1.5	31	<0.01	
5/97	7.6	7.99	580	468	0.04		<0.01	3.2	<0.004	<0.0005		1.3	27	<0.01	
5/98	7.54	7.64	550	535	0.07		0.01	3.3	<0.008	<0.0005		1.2	26	<0.01	

Note: All results in mg/L unless otherwise noted.

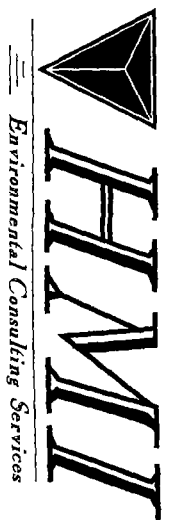
88-4.123

TABLE 5  
SUMMARY OF ESTIMATED AQUIFER AREAS ABOVE CLEANUP GOALS  
AND CONTAMINANT MASS-IN-PLACE  
ORMET CORPORATION  
HANNIBAL REDUCTION DIVISION  
HANNIBAL, OHIO

Sampling Date	Estimated Area of Aquifer Above 4 mg/L Fluoride	% Change	Estimated Area of Aquifer Above 0.2 mg/L Amenable CN	% Change
6/88	43.32 a.		24.53 a.	
1/95	48.36 a.	+11.6	5.93 a.	-75.8
5/97	43.67 a.	-9.7	21.30 a.	+259
5/98	36.85 a.	-15.6	10.52 a.	-50.6

Sampling Date	Estimated Fluoride Mass-in-Place	% Change	Estimated Total CN Mass-in-Place	% Change
6/88	85,702 lbs.		6,821 lbs.	
1/95	28,168 lbs.	-67.1	4,271 lbs.	-37.4
5/97	29,033 lbs.	+3.1	2,943 lbs.	-31.1
5/98	23,888 lbs.	-17.7	2,597 lbs.	-11.8





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331 S. Main Street  
Washington, Pennsylvania 15301

PROJECT NO.: HMO0301	FILE NO.:
DRAWING: C070897A	PLOT SIZE: 11" x 30"
DRAFTED BY: SUP/EDA	DATE: 7/10/97
CHECKED BY: SUP/EDA	DATE:
APPROVED BY: SUP/EDA	DATE:
REVISION NO.:	DATE:

HANNIBAL

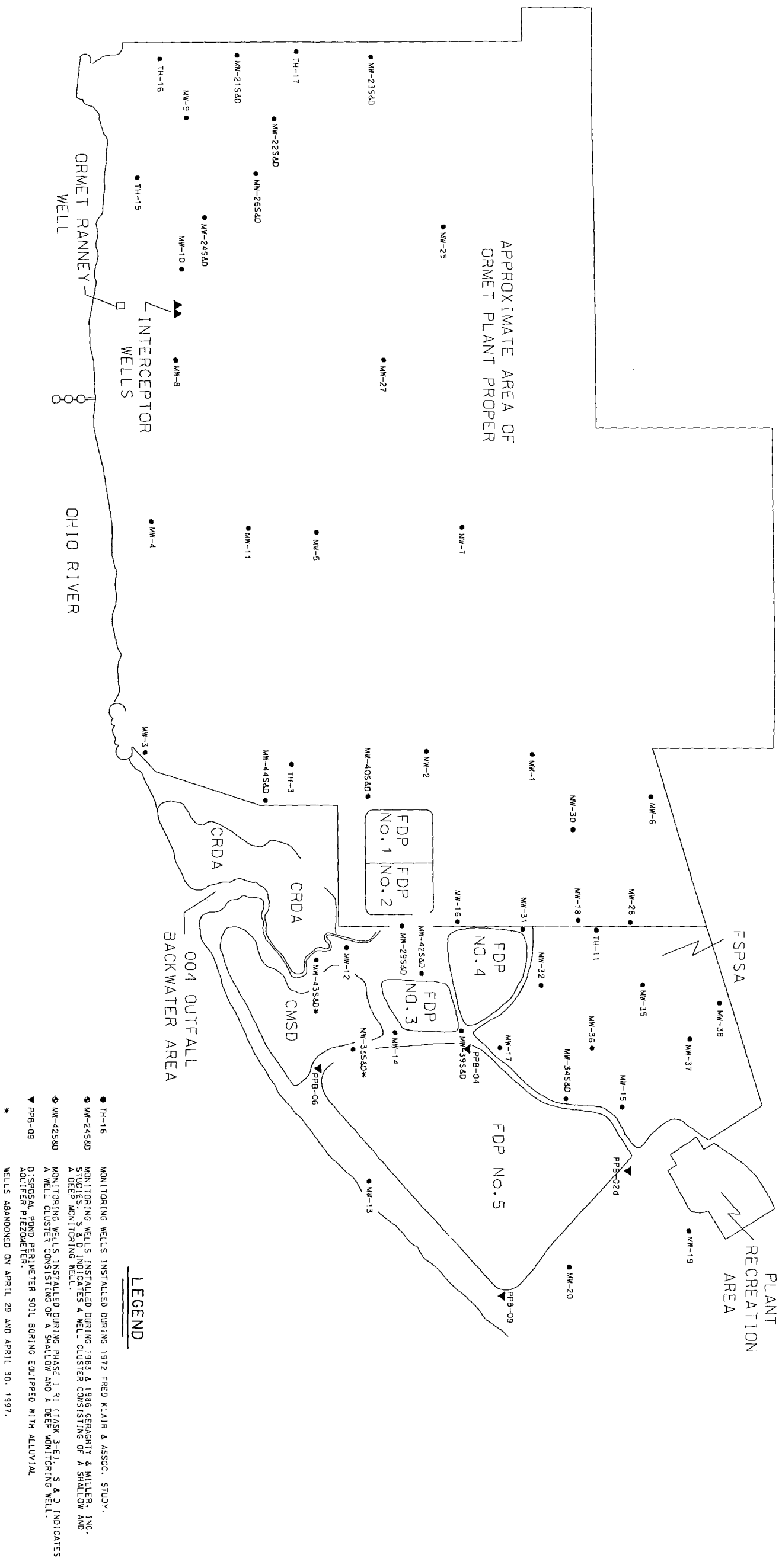
BASE MAP  
ORMET CORPORATION

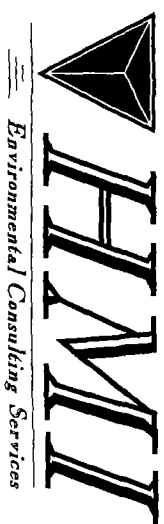
CHIC

FIGURE

1

0 300 Feet



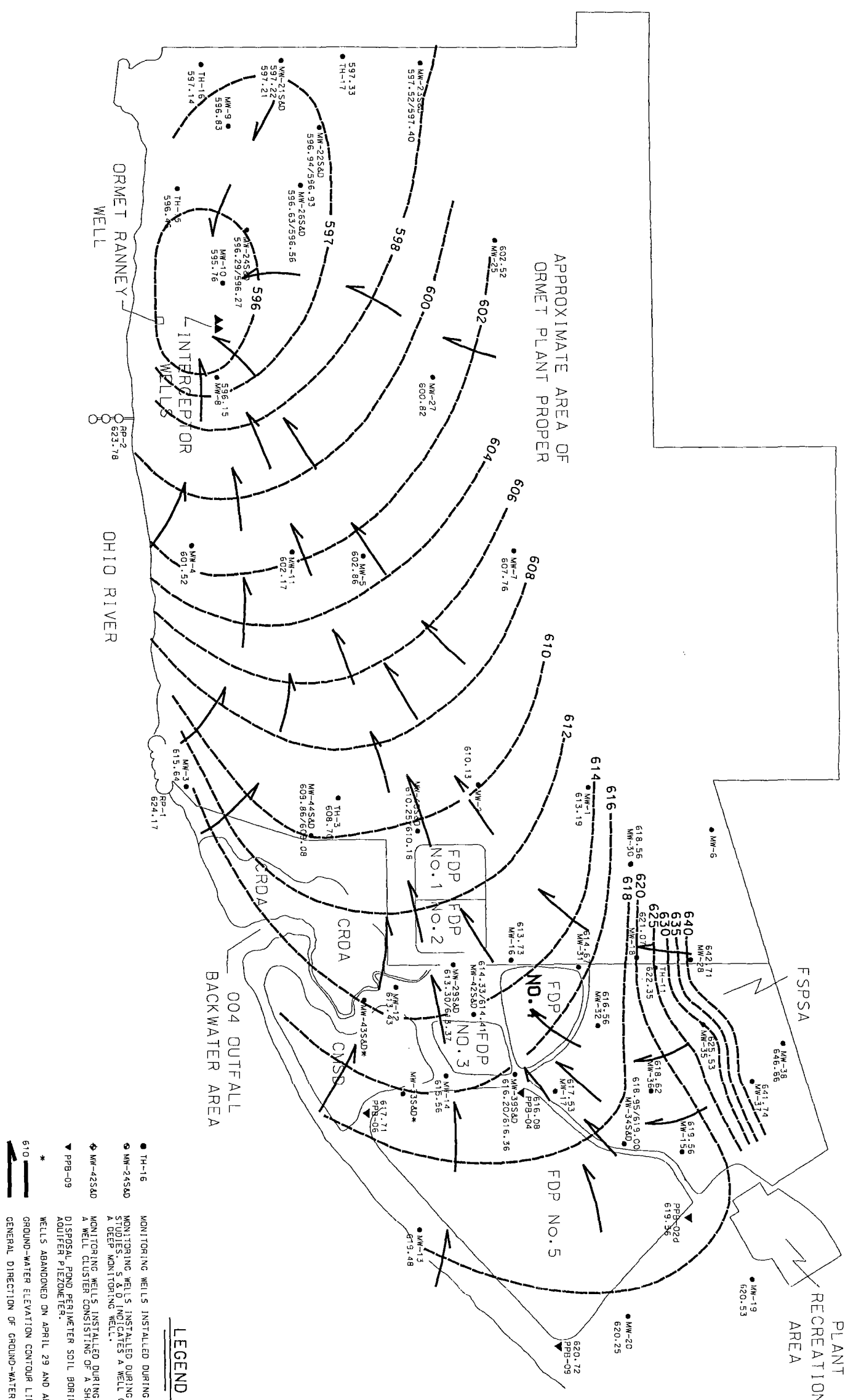


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PROJECT NO.: HM00201	FILE NO.:
DRAWING: C071097B	PLOT SIZE: 11"x30"
DRAWN BY: SJR/EDA	DATE: 7/10/97
CHECKED BY:	DATE:
APPROVED BY:	DATE:
REVISION NO.:	DATE:

HANNIBAL

GROUND-WATER ELEVATION CONTOUR MAP  
(BASED ON DATA COLLECTED MAY 5, 1997)  
ORMET CORPORATION



- TH-16 MONITORING WELLS INSTALLED DURING 1972 FRED KLAIR & ASSOC. STUDY.
- MW-245SD MONITORING WELLS INSTALLED DURING 1983 & 1986 GERAGHY & WILLER, INC. STUDIES. S & D INDICATES A WELL CLUSTER CONSISTING OF A SHALLOW AND A DEEP MONITORING WELL.
- MW-425SD MONITORING WELLS INSTALLED DURING PHASE 1 R1 (TASK 3-E1). S & D INDICATES A WELL CLUSTER CONSISTING OF A SHALLOW AND A DEEP MONITORING WELL.
- ▼ PWB-09 DISPOSAL POND REWIETER SOIL BORING EQUIPPED WITH ALLUVIAL AQUIFER PIEZOMETER.
- \* WELLS ABANDONED ON APRIL 29 AND APRIL 30, 1997.
- 610 GROUND-WATER ELEVATION CONTOUR LINE (FEET MSL)
- GENERAL DIRECTION OF GROUND-WATER FLOW



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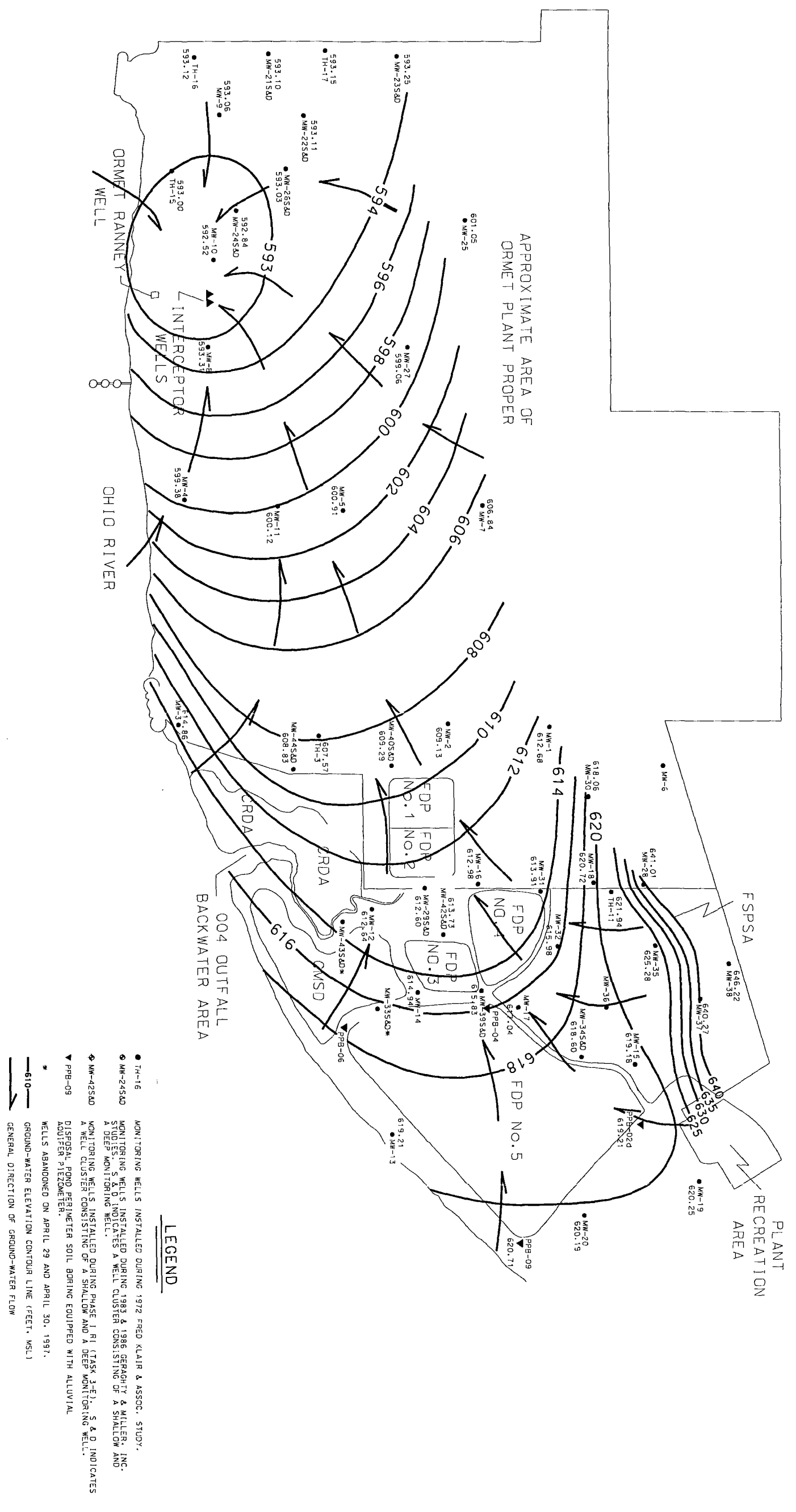
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DRAWING: C061298A	PLOT SIZE: 11" x 30"
DRAFTED BY: JAW/EDA	DATE: 6/12/98
CHECKED BY:	DATE:
APPROVED BY:	DATE:
REVISION NO.:	DATE:

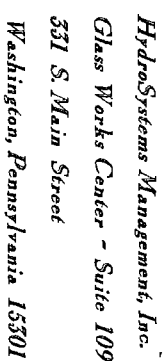
HANNIBAL

GROUND-WATER ELEVATION CONTOUR MAP  
(BASED ON DATA COLLECTED APRIL 17, 1998)

ORMET CORPORATION

OHIO

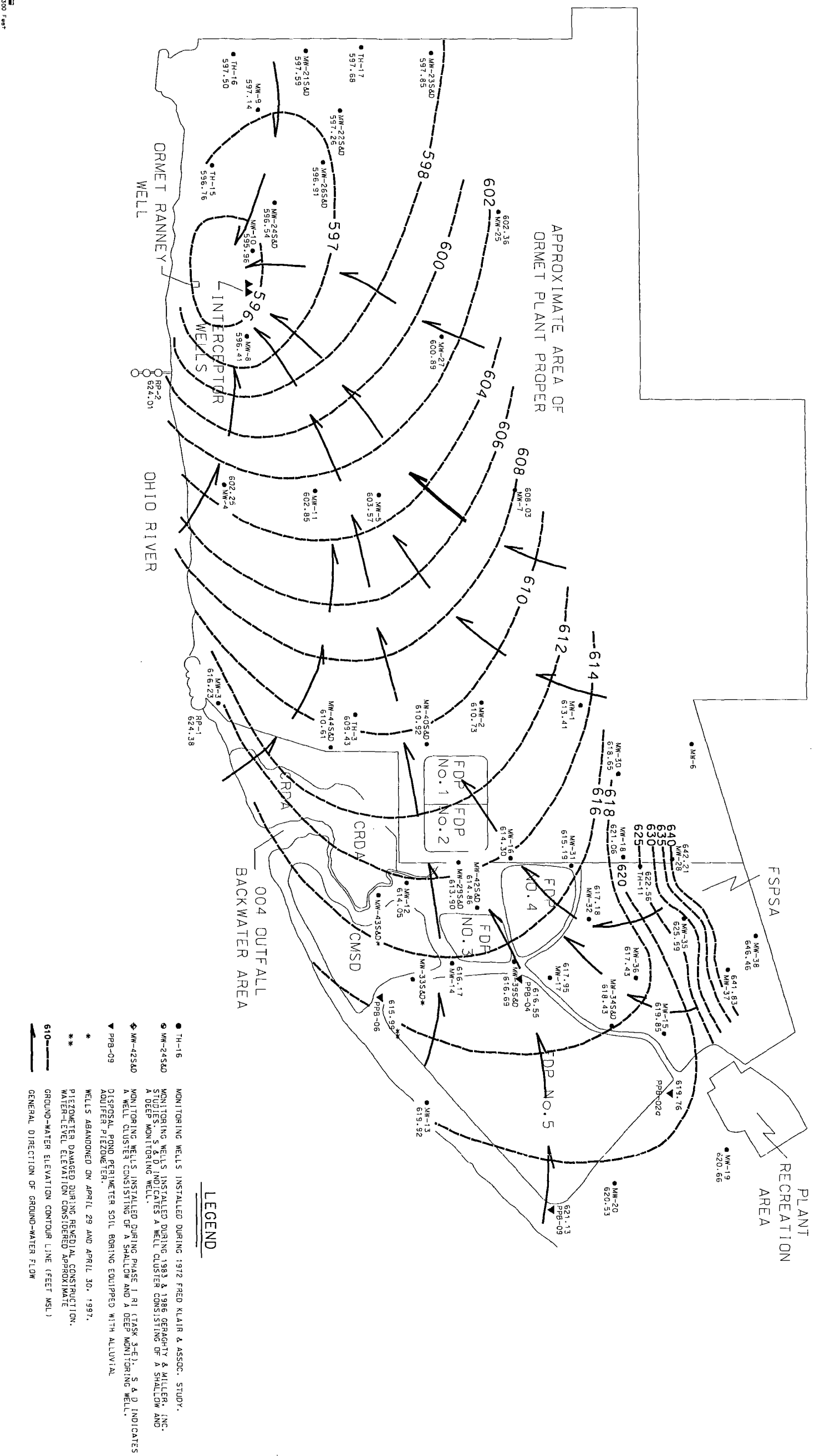




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DRAWN BY: JAW/EDA	DATE: 11/3/98
CHECKED BY:	DATE:
APPROVED BY:	DATE:
REVISION NO.:	DATE:

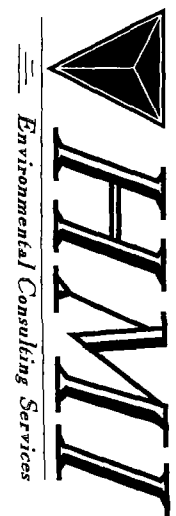
GROUND-WATER ELEVATION CONTOUR MAP  
(BASED ON DATA COLLECTED AUGUST 31, 1998)  
ORMET CORPORATION

FIGURE 4









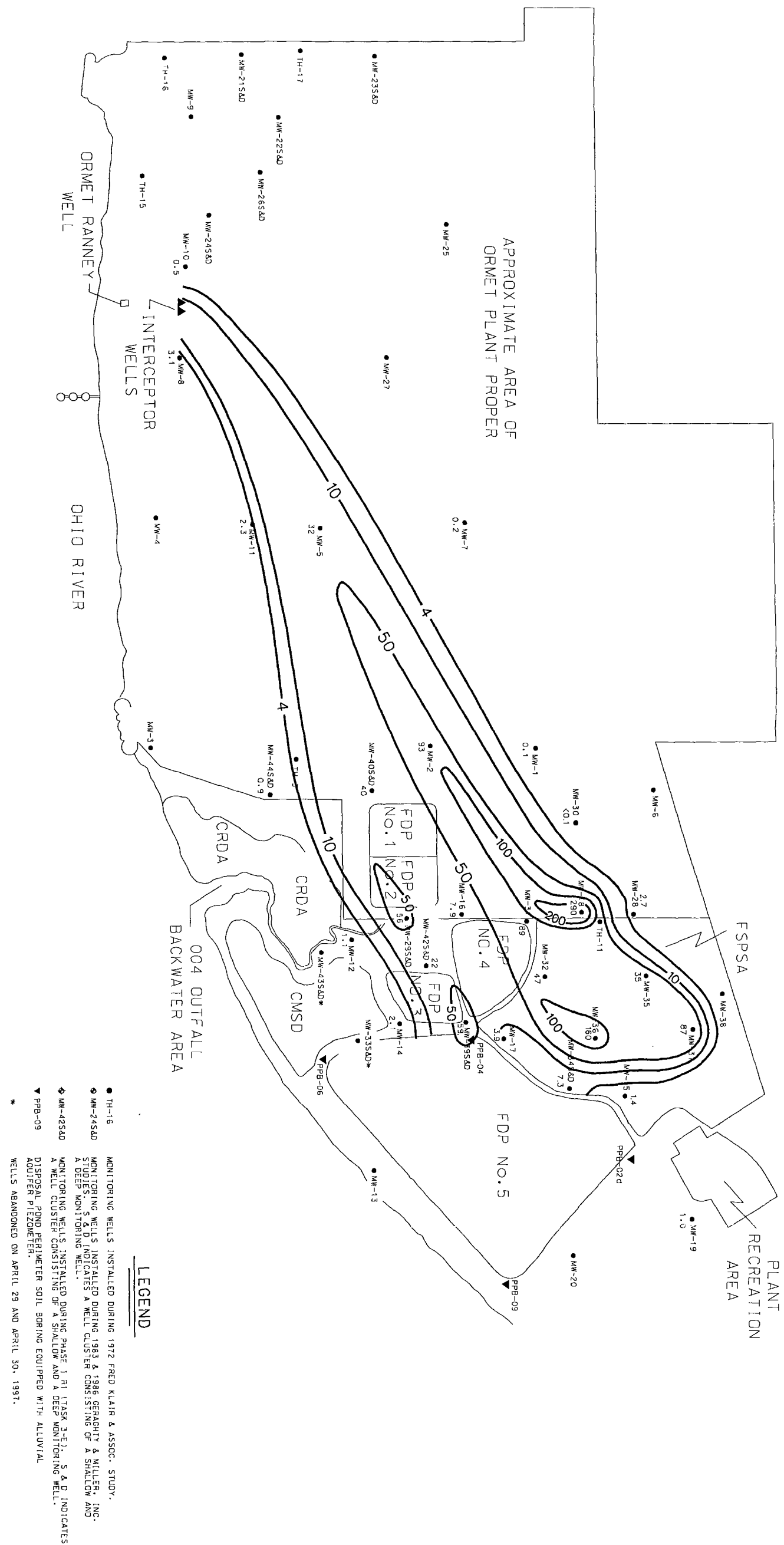
HydroSystems Management, Inc.  
Glass Works Center - Suite 109  
531 S. Main Street  
Washington, Pennsylvania 15301

PROJECT NO.: HMO0301	FILE NO.:
DRAWING: C21508B	PLOT SIZE: 11" x 30"
DRAWN BY: SP/EDA	DATE: 7/10/97
CHECKED BY:	DATE:
APPROVED BY:	DATE:
REVISION NO.:	DATE:

HANNIBAL

FLUORIDE ISOPLETH MAP  
FOR THE ALLUVIAL AQUIFER  
(BASED ON SAMPLES COLLECTED JANUARY 1995)  
ORMET CORPORATION

OHIO  
FIGURE  
6





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PROJECT NO.: HMO0301	FILE NO.:
DRAWING: C071497A	PLOT SIZE: 11" x 30"
DRAFTED BY: SUP/EDA	DATE: 7/14/97
CHECKED BY:	DATE:
APPROVED BY:	DATE:
REVISION NO.:	DATE:

HANNTBAL

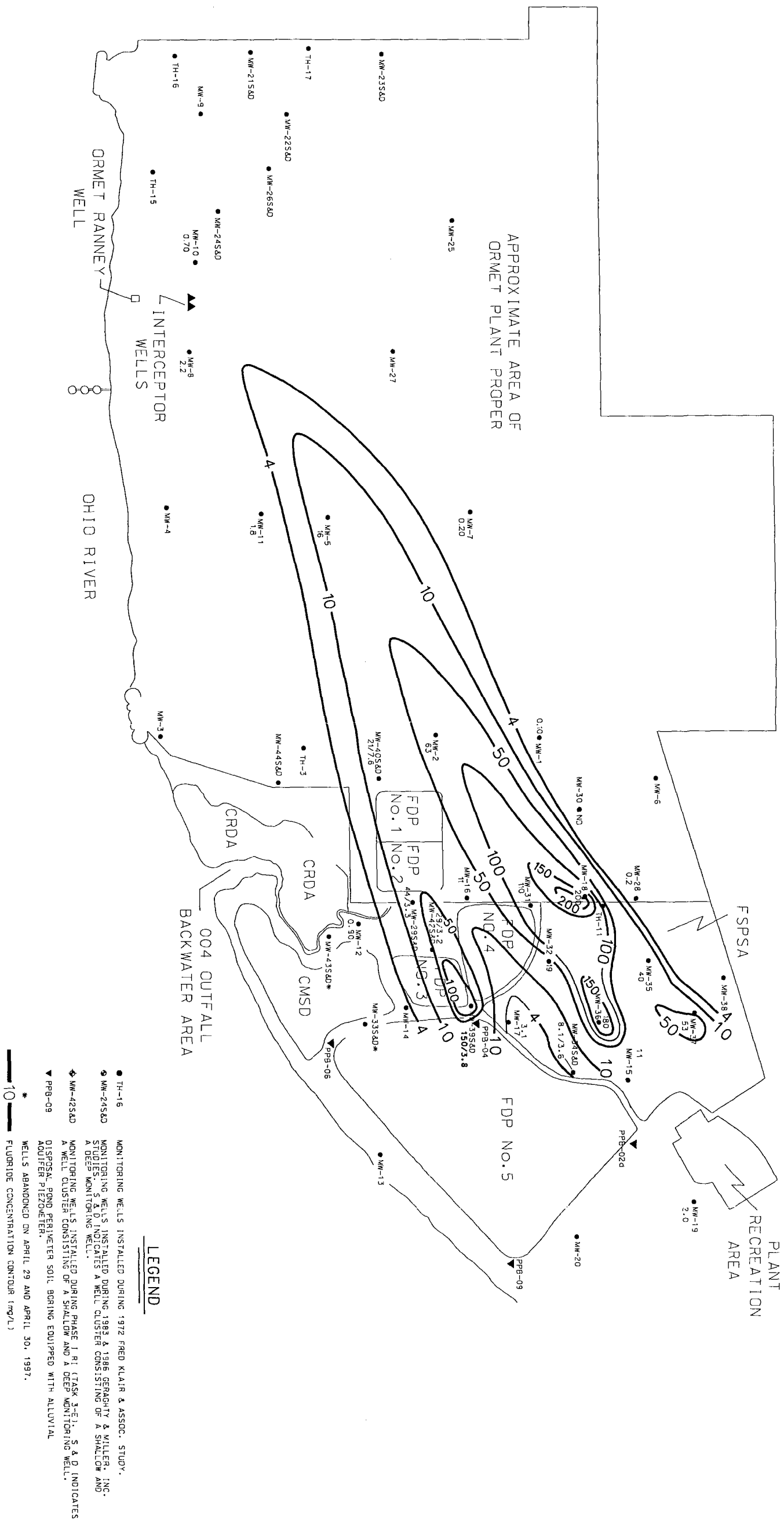
FLUORIDE ISOPLETH MAP  
FOR THE ALLUVIAL AQUIFER  
(BASED ON SAMPLES COLLECTED MAY 5-9, 1997)  
ORMET CORPORATION

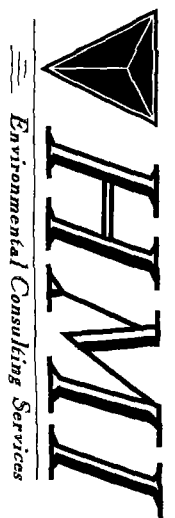
OHIO

FIGURE

7

0 300 Feet





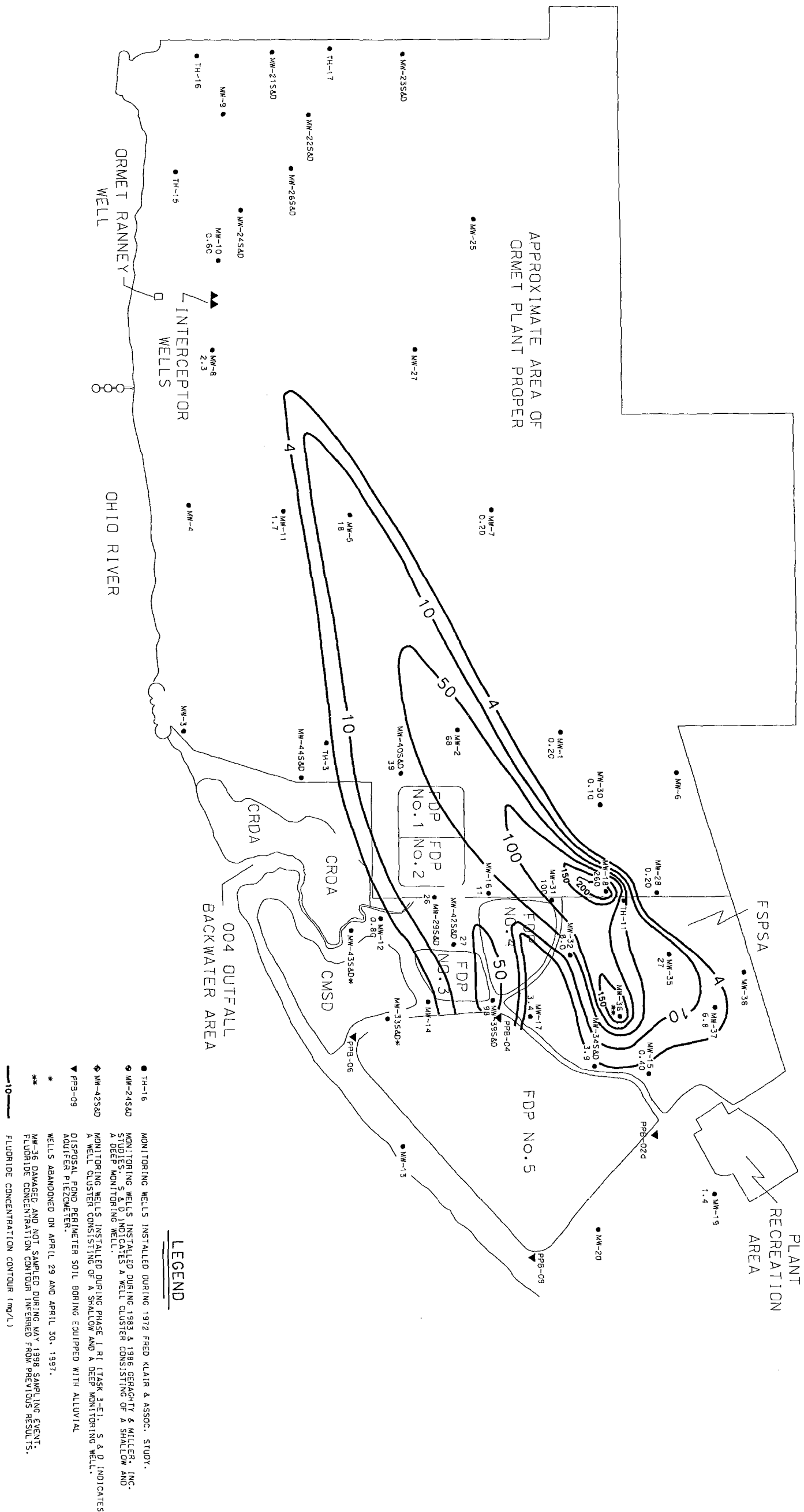
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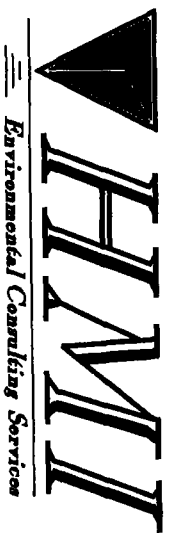
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DRAFTED BY: JAM/EDA	DATE: 6/12/98
CHECKED BY:	DATE:
APPROVED BY:	DATE:
REVISION NO.:	DATE:

FLUORIDE ISOPLETH MAP  
FOR THE ALLUVIAL AQUIFER  
(BASED ON SAMPLES COLLECTED MAY 4-8, 1998)  
ORMET CORPORATION

FIGURE  
8

0 300 FEET





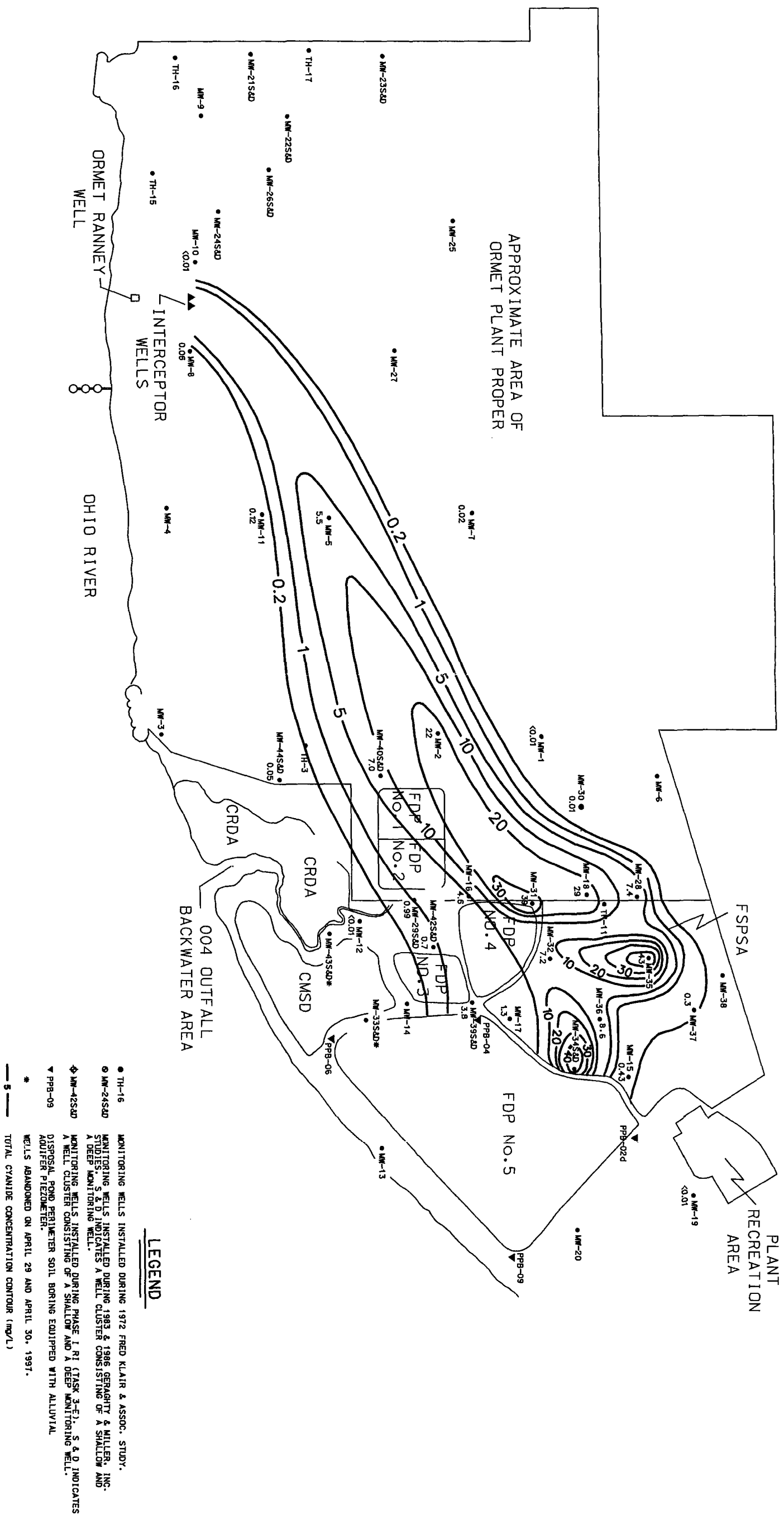
HydroSystems Management, Inc.  
Glass Works Center - Suite 109  
331 S. Main Street  
Washington, Pennsylvania 15301

PROJECT NO.: HM00301	FILE NO.:
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CHECKED BY:	DATE:
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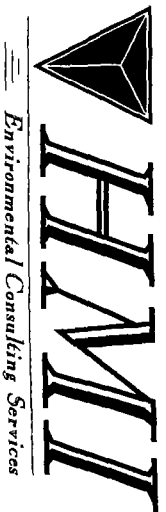
TOTAL CYANIDE ISOPLETH MAP  
(BASED ON SAMPLES COLLECTED JUNE-JULY, 1988)  
ORMET CORPORATION

FIGURE  
9

0 300 Feet







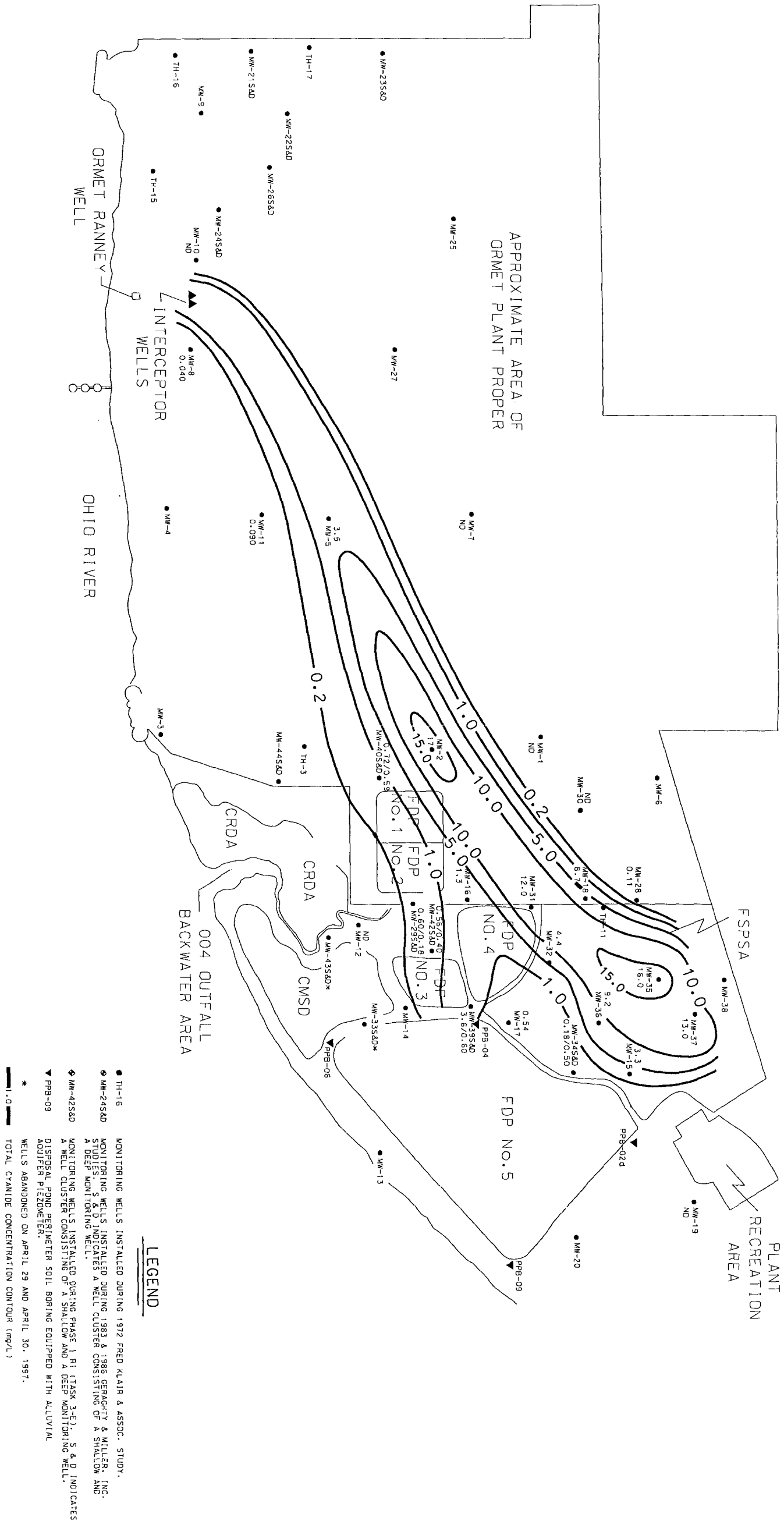
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331 S. Main Street  
Washington, Pennsylvania 15301

PROJECT NO: HMO0301	FILE NO:
DRAWING: C07597A	PLOT SIZE: 11" x 30"
DRAFTED BY: SUPVEDA	DATE: 7/15/97
CHECKED BY:	DATE:
APPROVED BY:	DATE:
REVISION NO:	DATE:

**TOTAL CYANIDE ISOPLETH MAP**  
**FOR THE ALLUVIAL AQUIFER**  
**(BASED ON SAMPLES COLLECTED MAY 5-9, 1997)**  
ORMET CORPORATION

FIGURE  
**11**

0 300 Feet





Environmental Consulting Services

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Washington, Pennsylvania 15301

PROJECT NO.: HMO0308	FILE NO.:
DRAWING: C061298C	PLOT SIZE: 11" x 30"
DRAFTED BY: JMW/EDA	DATE: 6/12/98
CHECKED BY:	DATE:
APPROVED BY:	DATE:
REVISION NO.:	DATE:

HANNIBAL

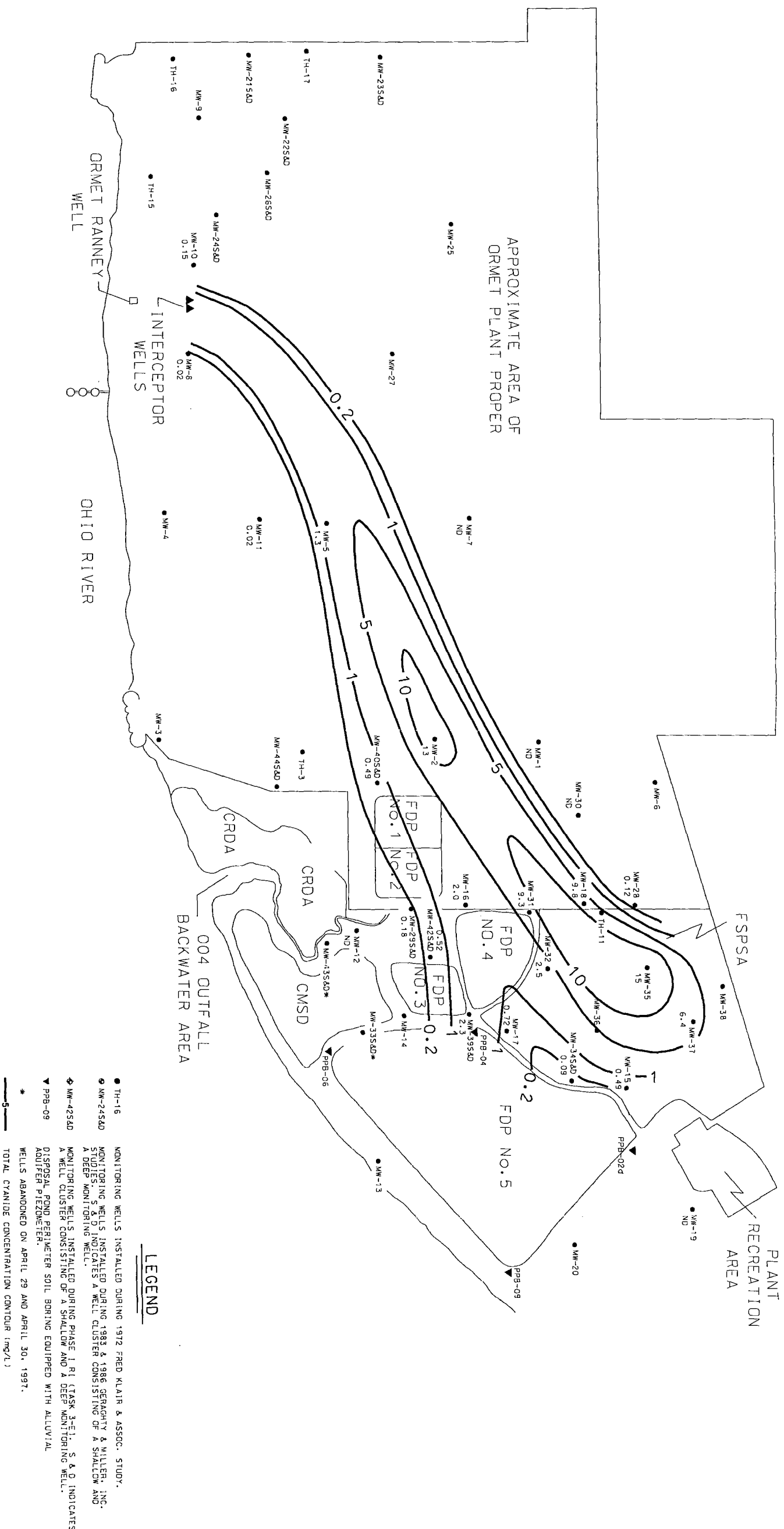
TOTAL CYANIDE ISOPLETH MAP  
FOR THE ALLUVIAL AQUIFER  
(BASED ON SAMPLES COLLECTED MAY 4-8, 1998)  
ORMET CORPORATION

OHIO

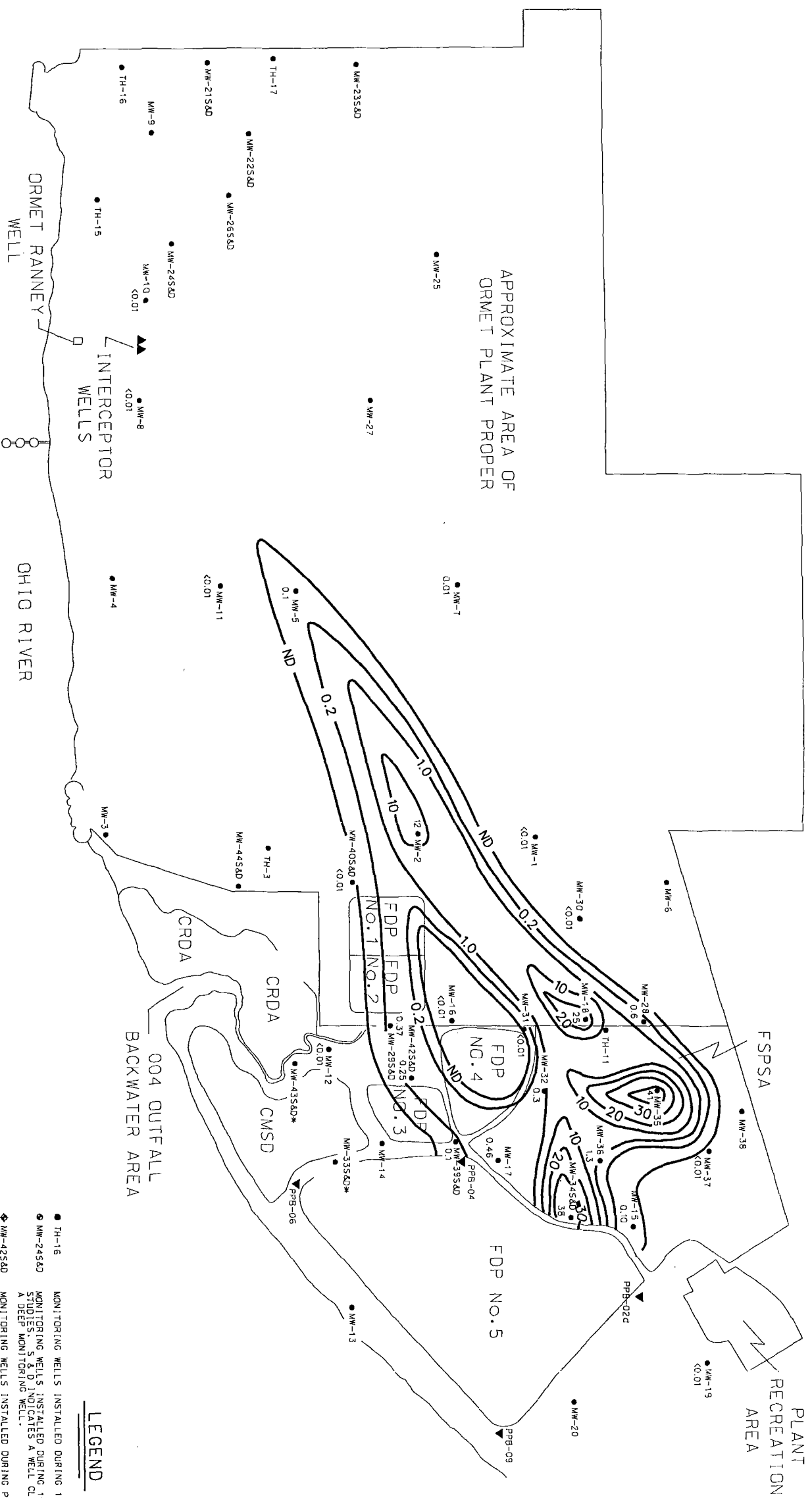
FIGURE

12

0 300 Feet



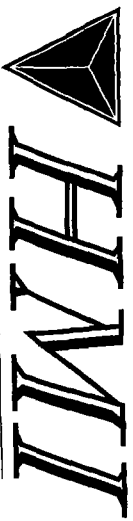




- TH-16  
MONITORING WELLS INSTALLED DURING 1972 FRED KLAIR & ASSOC. STUDY.
- ◆ MW-245SD  
MONITORING WELLS INSTALLED DURING 1983 & 1988 GEORCHY & MILLER, INC. STUDIES. S & D INDICATES A WELL CLUSTER CONSISTING OF A SHALLOW AND A DEEP MONITORING WELL.
- ◆ MW-425SD  
MONITORING WELLS INSTALLED DURING PHASE 1 RI. S & D INDICATES A WELL CLUSTER CONSISTING OF A SHALLOW AND A DEEP MONITORING WELL.
- ▼ PPB-09  
DISPOSAL POND PERMEATE SOIL BORING EQUIPPED WITH ALUVIAL ACQUIFER PIEZOMETER.
- \*  
WELLS ABANDONED ON APRIL 29 AND APRIL 30, 1997.

—1.0—  
AMEANABLE CYANIDE CONCENTRATION CONTOUR (mg/L)

A horizontal scale bar with a black outline. The left end is labeled '0' and the right end is labeled '300 feet'.



Environmental Consulting Services

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PROJECT NO.: H4003D1	FILE NO.:
DRAWING: C121598E	PLOT SIZE: 11" x 300"
DRAWN BY: S.F. NEDA	DATE: 7/10/97
CHECKED BY:	DATE:
APPROVED BY:	DATE:
REVISION NO.:	DATE:

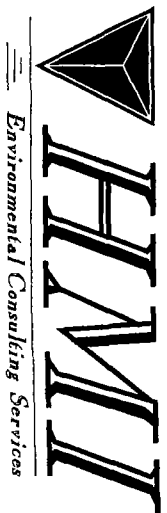
# HANNIBAL

AMENABLE CYANIDE ISOPLETTH MAP  
FOR THE ALLUVIAL AQUIFER  
(BASED ON SAMPLES COLLECTED JUNE-JULY, 1988)  
ORMET CORPORATION

0110

FIGURE

 $\omega$



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PROJECT NO.:	HM00301	FILE NO.:	
DRAWING:	C120898A	PLOT SIZE:	11"x20"
DRAFTED BY:	JAM/EDA	DATE:	12/08/98
CHECKED BY:		DATE:	
APPROVED BY:		DATE:	
REVISION NO.:		DATE:	

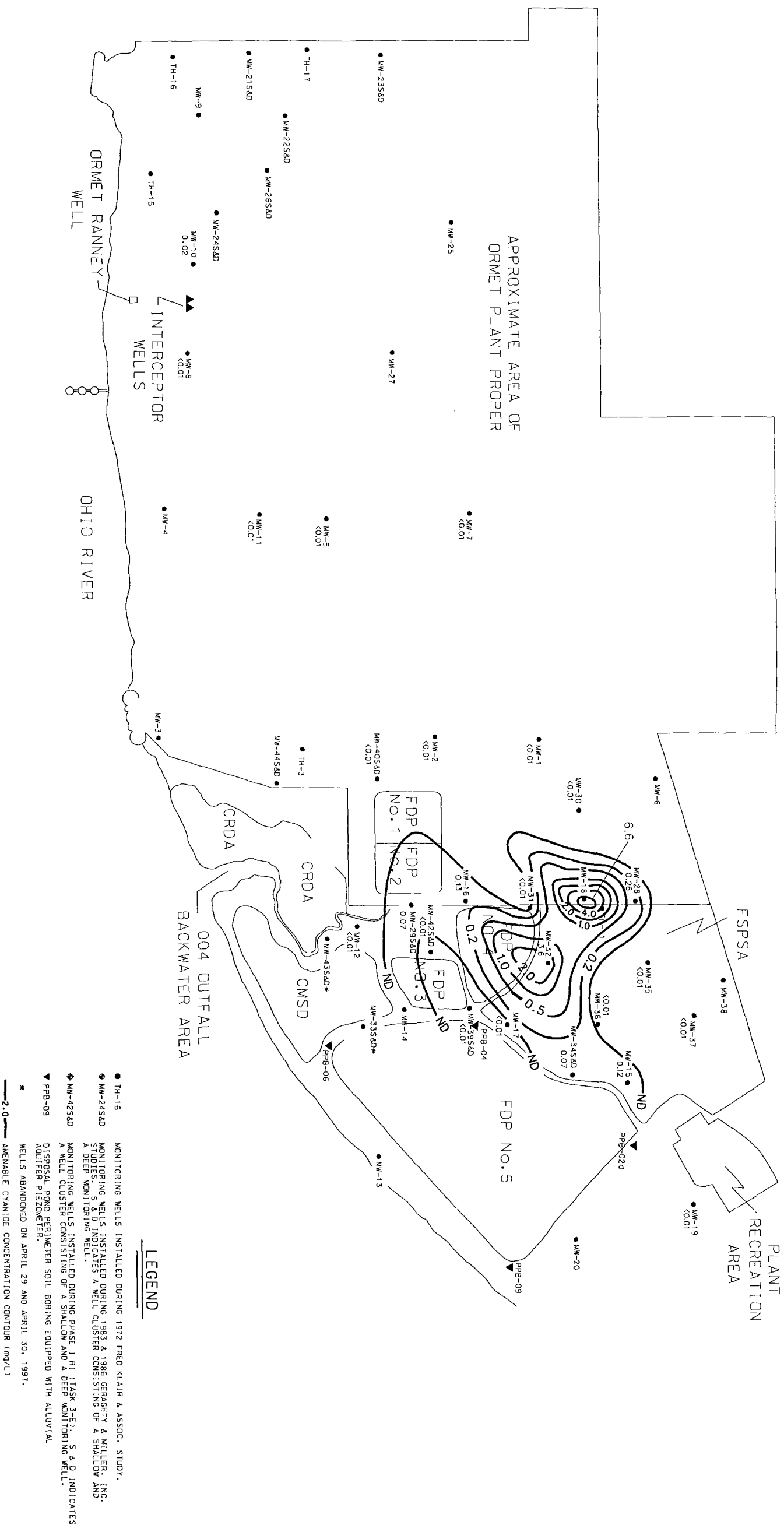
AMENABLE CYANIDE ISOPLETH MAP  
FOR THE ALLUVIAL AQUIFER  
(BASED ON SAMPLES COLLECTED JANUARY 1995)  
ORMET CORPORATION

OHIO

FIGURE

14

0 100 Feet

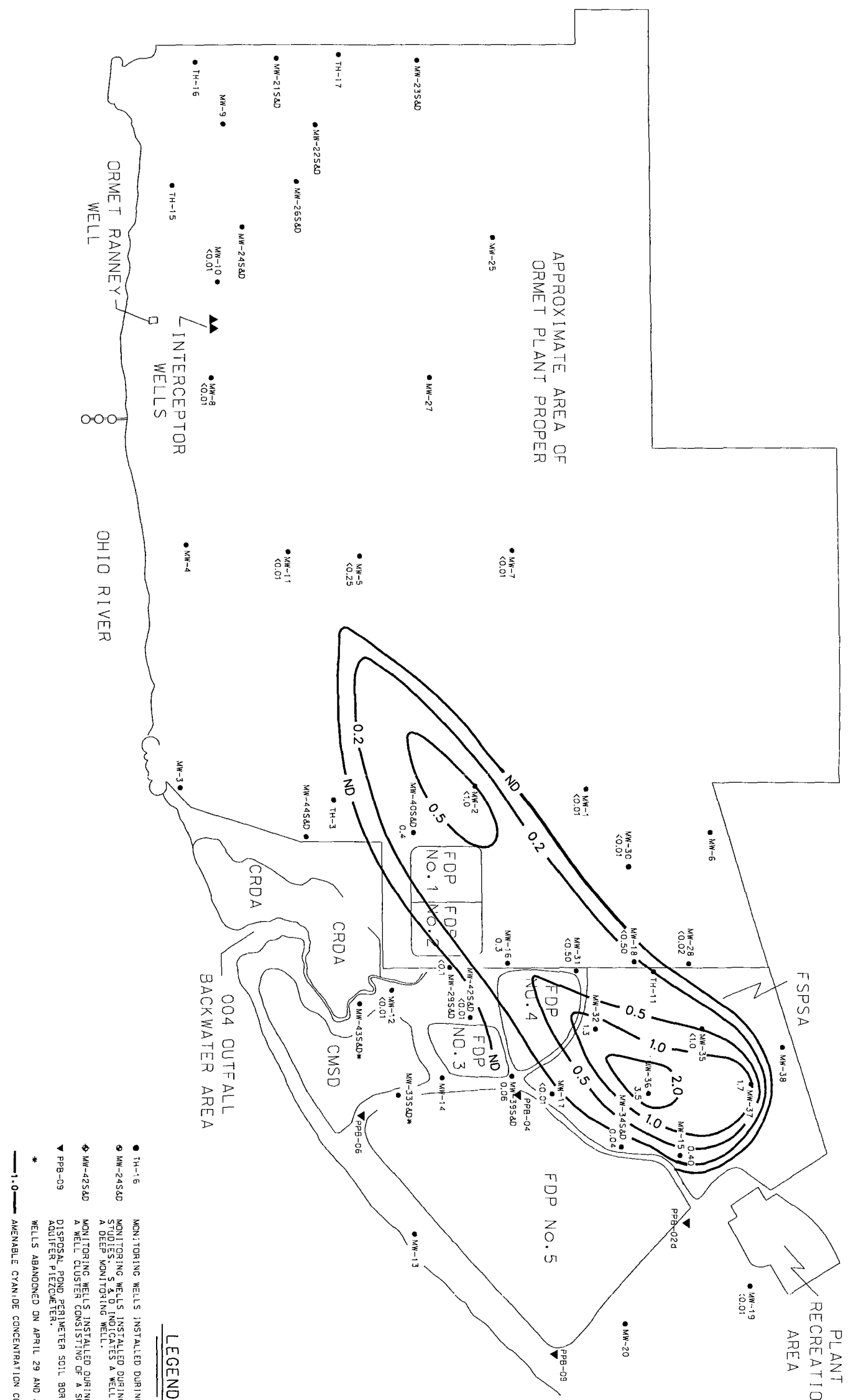




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351 S. Main Street  
Washington, Pennsylvania 15301

PROJECT NO.: HM00301	FILE NO:
DRAWING: C1208988	PLOT SIZE: 11" x 30"
DRAFTED BY: JAW/EDA	DATE: 12/08/98
CHECKED BY:	DATE:
APPROVED BY:	DATE:
REVISION NO.:	DATE:

AMENABLE CYANIDE ISOPLETH MAP  
FOR THE ALLUVIAL AQUIFER  
(BASED ON SAMPLES COLLECTED MAY 5-9, 1997)  
ORMET CORPORATION  
HANNIBAL



● TH-16 MONITORING WELLS INSTALLED DURING 1972 FRED KLAIR & ASSOC. STUDY.  
● MW-24SAD MONITORING WELLS INSTALLED DURING 1983 & 1988 GERRAGHTY & MILLER, INC. STUDIES. S & D INDICATES A WELL CLUSTER CONSISTING OF A SHALLOW AND A DEEP MONITORING WELL.  
● MW-42SAD MONITORING WELLS INSTALLED DURING PHASE 1 RI (TASK 3-E); S & D INDICATES A WELL CLUSTER CONSISTING OF A SHALLOW AND A DEEP MONITORING WELL.  
▼ PPB-09 DISPOSAL POND PERIMETER SOIL BORING EQUIPPED WITH ALLUVIAL AQUIFER PIEZOMETER.  
\* WELLS ABANDONED ON APRIL 29 AND APRIL 30, 1997.  
—1.0— AMENABLE CYANIDE CONCENTRATION CONTOUR (mg/L)

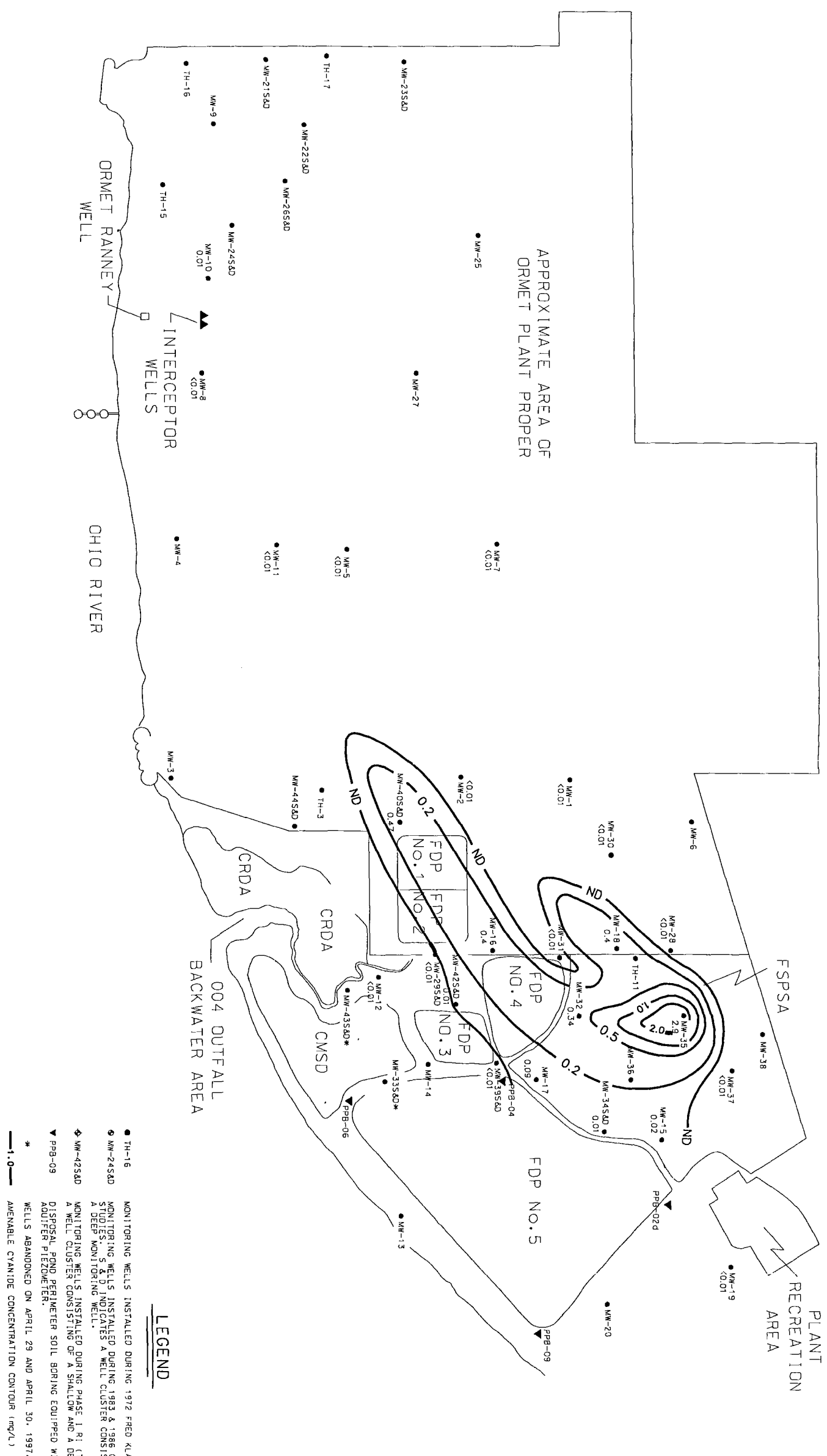
LEGEND



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331 S. Main Street  
Washington, Pennsylvania 15301

PROJECT NO:	HM00301	FILE NO:	
DRAWING:	C120898C	PLOT SIZE:	11" x 30"
DRAFTED BY:	JMW/EDA	DATE:	12/03/98
CHECKED BY:		DATE:	
APPROVED BY:		DATE:	
REVISION NO.:		DATE:	

AMENABLE CYANIDE ISOPLETH MAP  
FOR THE ALLUVIAL AQUIFER  
(BASED ON SAMPLES COLLECTED MAY 4-8, 1998)  
ORMET CORPORATION





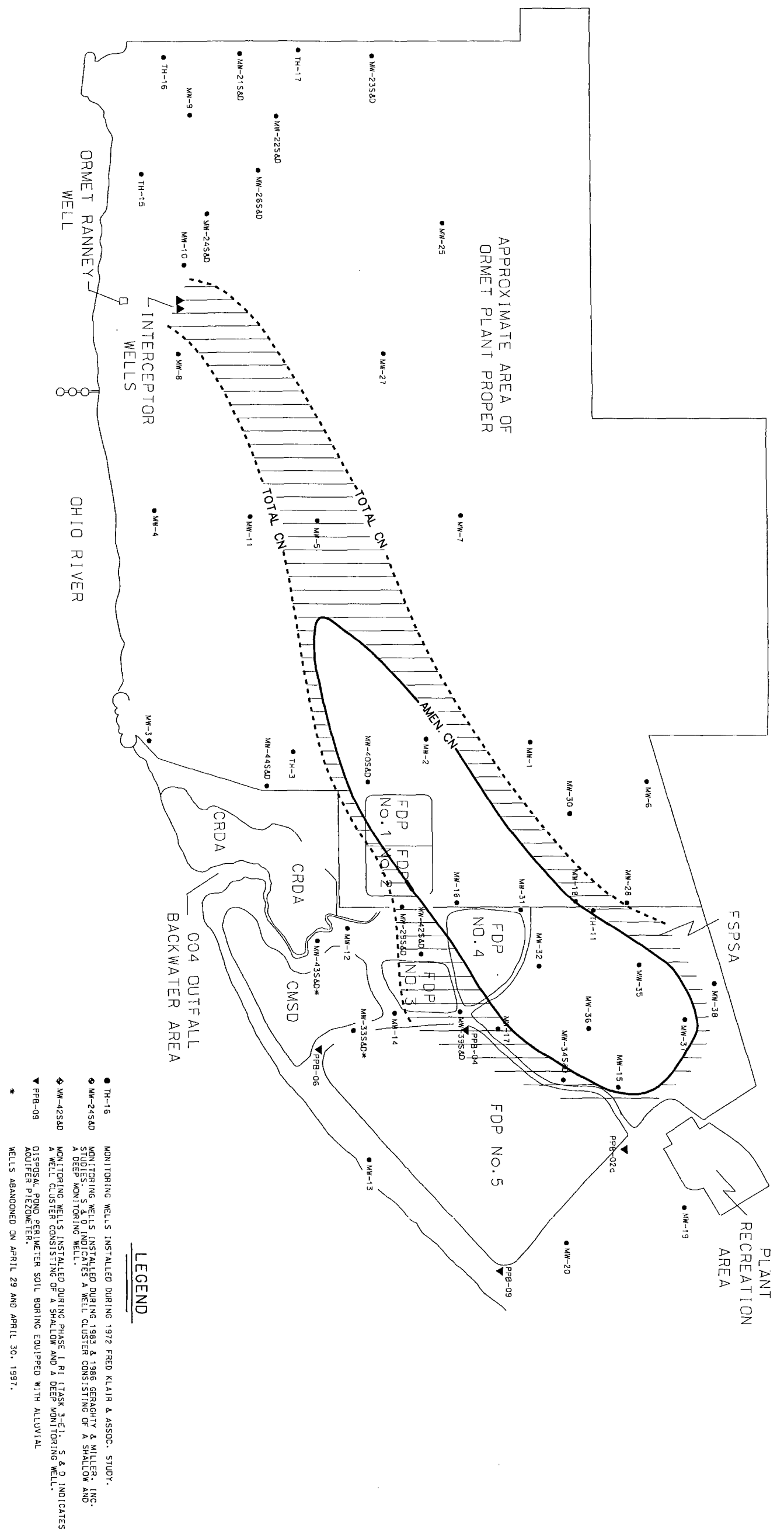
HydroSystems Management, Inc.  
Glass Works Center - Suite 109  
351 S. Main Street  
Washington, Pennsylvania 15301

PROJECT NO.:	HND0301	FILE NO.:	
DRAWING:	C12B98F	PLOT SIZE:	11" x 300"
DRAFTED BY:	S.P.VEDA	DATE:	7/10/97
CHECKED BY:		DATE:	
APPROVED BY:		DATE:	
REVISION NO.:		DATE:	

1997 COMPARISON OF TOTAL VS. AMENABLE CYANIDE  
DISTRIBUTION IN GROUND WATER  
(BASED ON 0.2 mg/L CONCENTRATION CONTOUR)  
ORMET CORPORATION

FIGURE  
17

0 300 Feet





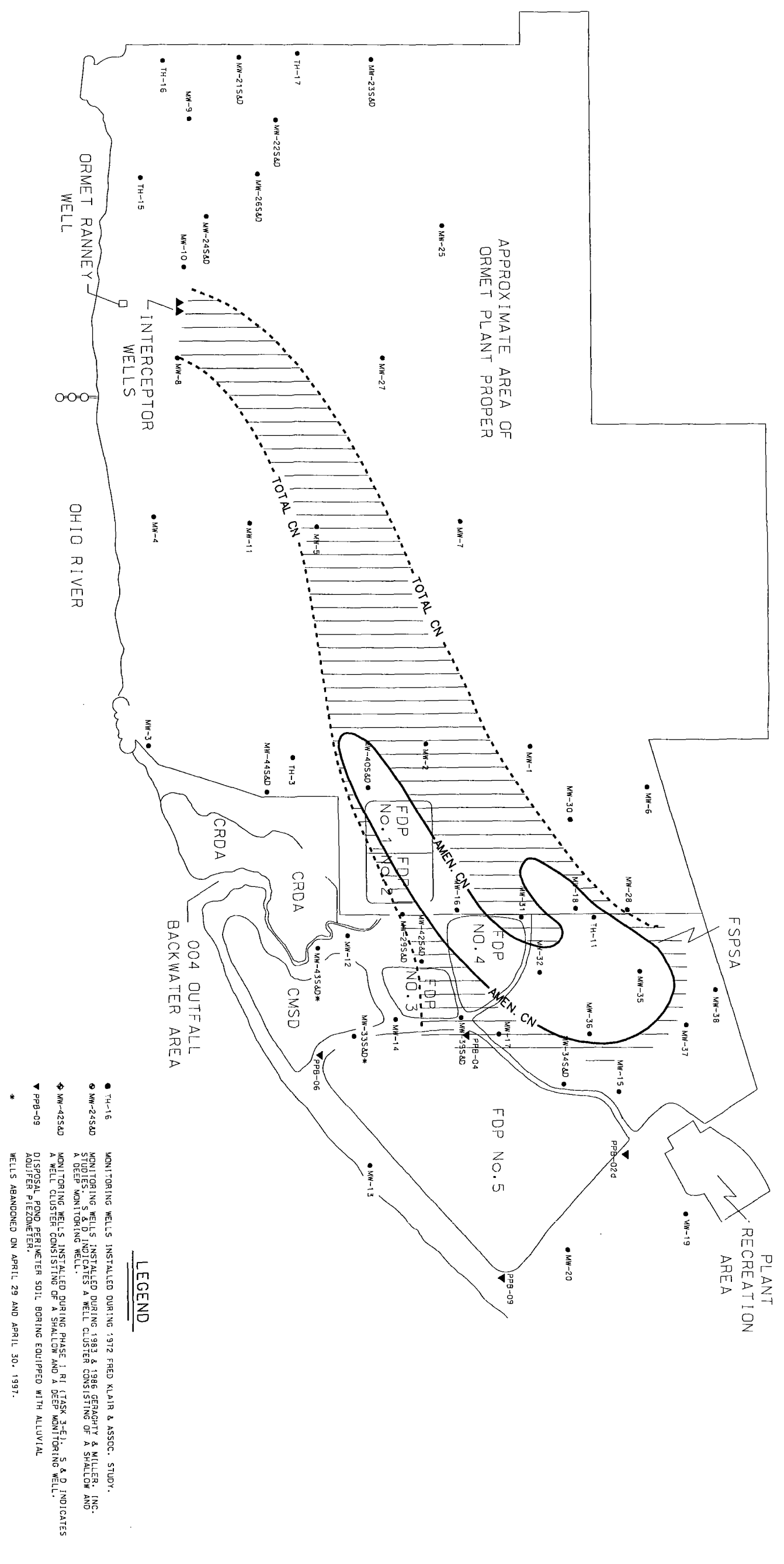
HydroSystems Management, Inc.  
Glass Works Center - Suite 109  
331 S. Main Street  
Washington, Pennsylvania 15301

PROJECT NO.: HMO0301	FILE NO.
DRAWING: C12598Q	PLOT SIZE: 11" x 30"
DRAFTED BY: SUP/EDA	DATE: 7/10/97
CHECKED BY:	DATE:
APPROVED BY:	DATE:
REVISION NO.:	DATE:

1998 COMPARISON OF TOTAL VS. AMENABLE CYANIDE  
DISTRIBUTION IN GROUND WATER  
(BASED ON 0.2 mg/L CONCENTRATION CONTOURS)  
ORMET CORPORATION

FIGURE  
18

0  
300 Feet



## APPENDIX A

## APPENDIX A

### WATER SAMPLING LOG FORMS

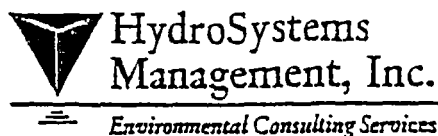
Appendix A-1	Water Sampling Log Forms for May 1997 Monitoring Event
Appendix A-2	Water Sampling Log Forms for May 1998 Monitoring Event
Appendix A-3	Water Sampling Log Forms for August/September 1998 Monitoring Event



**APPENDIX A-1**

**WATER SAMPLING LOG FORMS FOR MAY 1997 MONITORING EVENT**

# SAMPLING OF MONITORING WELLS DAILY CHECKLIST.



PROJECT NO: Hm003.07  
 LOCATION: Ormet / Hannibal Ohio  
 SAMPLING PERSONNEL: J Campbell C Standard  
 COMPLETED BY: J Campbell

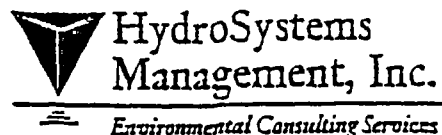
mw-36,37,41  
 WELL(S): mw-15,17,32,34,35  
 DATE: 5-6-97  
 TIME: \_\_\_\_\_

ITEMS	OK	NA	NOTES
<b>PRIOR TO SAMPLING</b>			
Health & safety plan; reviewed; equipment ready.	✓		
Sample containers, coolers, received from laboratory <u>ice</u> or ice pack and coolers ready.	✓		
Sampling equipment and supplies inventoried, clean and operational.	✓		
On-site client contact notified.	✓		
Condition of well noted.	✓		
Well area prepared for sampling; plastic placed around well; gasoline-powered pumps placed downwind.	✓		
Water-level measurements made and recorded on Water Sampling Log with other pertinent field information.	✓		
Field instruments calibrated; calibration recorded in field logbook	✓		pH 4.0, 7.0 + 10.0 SPL 700 + 3500 $\mu$ mhos/cm
Sample containers labelled; preservatives added, if necessary.	✓		By Lab
<b>DURING AND AFTER SAMPLING:</b>			
Three to five well volumes purged.	✓		3x if 10% stabilization of pH+SPL 5x max; if dyes sample upon recovery
Sample collected using a bailer or pump as per sampling plan.	✓		disposable bailer
Measurement of field parameters recorded on Water Sampling Log and in field log book.	✓		
Sample containers filled according to collection protocol of analyses.	✓		
Field and trip blanks collected; replicates or split samples collected and recorded in field log book.	✓		mw-15 (mw-DUP-1)
Samples stored on ice in coolers.	✓		
Water Sampling Log and Chain-of-Custody Recorded completed	✓		
Reusable equipment decontaminated; non-reusable equipment disposed of in appropriate manner.	✓		
Well secured and locked.	✓		

Additional Comments: Kemron Lab Courier picked up Samples

Original to Field Project File; copy to Project Manager and to QA Officer.

# SAMPLING OF MONITORING WELLS DAILY CHECKLIST.



PROJECT NO: Hm003.07

LOCATION: Ormet / Hannibal Ohio

SAMPLING PERSONNEL: J Campbell C Standard

COMPLETED BY: J Campbell

WELL(S): <sup>mw-40s, 40d, 29d</sup>  
mw-39s, 39d, 2, 40s, 42d, 19

DATE: 5-7-97

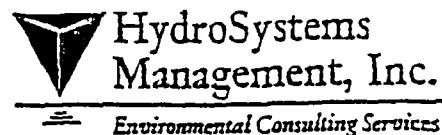
TIME: \_\_\_\_\_

ITEMS	OK	NA	NOTES
<b>PRIOR TO SAMPLING</b>			
Health & safety plan; reviewed; equipment ready.	✓		
Sample containers, coolers, received from laboratory, <u>ice</u> or ice pack and coolers ready.	✓		
Sampling equipment and supplies inventoried, clean and operational.	✓		
On-site client contact notified.	✓		
Condition of well noted.	✓		
Well area prepared for sampling; plastic placed around well; gasoline -- powered pumps placed downwind.	✓		
Water -- level measurements made and recorded on Water Sampling Log with other pertinent field information.	✓		
Field instruments calibrated; calibration recorded in field logbook	✓		pH 4.0, 7.0 + 10.0 SPC 700 + 3500 $\mu$ mhos/cm
Sample containers labelled; preservatives added, if necessary.	✓		By Lab
<b>DURING AND AFTER SAMPLING:</b>			
Three to five well volumes purged.	✓		3x if 10% stabilization of pH+SPC 5x max; if dyes sample upon recovery
Sample collected using a bailer or pump as per sampling plan.	✓		disposable bailer
Measurement of field parameters recorded on Water Sampling Log and in field log book.	✓		
Sample containers filled according to collection protocol of analyses.	✓		
Field and trip blanks collected; replicates or split samples collected and recorded in field log book.	✓		
Samples stored on ice in coolers.	✓		
Water Sampling Log and Chain-of-Custody Recorded completed.	✓		
Reusable equipment decontaminated; non-reusable equipment disposed of in appropriate manner.	✓		
Well secured and locked.	✓		

Additional Comments: Kemron Lab Courier picked up Samples

Original to Field Project File; copy to Project Manager and to QA Officer.

# SAMPLING OF MONITORING WELLS DAILY CHECKLIST.



PROJECT NO: Hm003.07  
 LOCATION: Ormet / Hannibal Ohio  
 SAMPLING PERSONNEL: J Campbell C Standard  
 COMPLETED BY: J Campbell

WELL(S): MW-31, 30, 18, 2, 5, 7, 8, 10  
 DATE: 5-8-97  
 TIME: \_\_\_\_\_

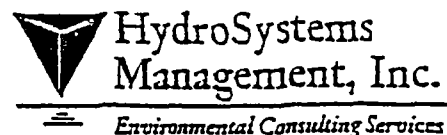
ITEMS	OK	NA	NOTES
<b>PRIOR TO SAMPLING</b>			
Health & safety plan; reviewed; equipment ready.	✓		
Sample containers, coolers, received from laboratory, <u>ice</u> or ice pack and coolers ready.	✓		
Sampling equipment and supplies inventoried, clean and operational.	✓		
On-site client contact notified.	✓		
Condition of well noted.	✓		
Well area prepared for sampling; plastic placed around well; gasoline-powered pumps placed downwind.	✓		
Water-level measurements made and recorded on Water Sampling Log with other pertinent field information.	✓		
Field instruments calibrated; calibration recorded in field logbook	✓		pH 4.0, 7.0 + 10.0 SPC 700 + 3500 $\mu$ mhos/cm
Sample containers labelled; preservatives added, if necessary.	✓		By Lab
<b>DURING AND AFTER SAMPLING:</b>			
Three to five well volumes purged.	✓		3x if 10% stabilization of pH+SPC 5x max; if dries sample upon recovery
Sample collected using a bailer or pump as per sampling plan.	✓		disposable bailer
Measurement of field parameters recorded on Water Sampling Log and in field log book.	✓		
Sample containers filled according to collection protocol of analyses.	✓		
Field and trip blanks collected; replicates or split samples collected and recorded in field log book.	✓		MW-7 (Dup-2) MW-31 (Dup-3)
Samples stored on ice in coolers.	✓		
Water Sampling Log and Chain-of-Custody Recorded completed.	✓		
Reusable equipment decontaminated; non-reusable equipment disposed of in appropriate manner.	✓		
Well secured and locked.	✓		

Additional Comments: Kemron Lab Courier picked up Samples; PCE sampled in MW-30, 31, 18

Original to Field Project File; copy to Project Manager and to QA Officer.

MW-2, 5 + Dup-3

# SAMPLING OF MONITORING WELLS DAILY CHECKLIST.



PROJECT NO: Hm003.07  
 LOCATION: Ormet / Hannibal Ohio  
 SAMPLING PERSONNEL: J Campbell C Standard  
 COMPLETED BY: J Campbell

WELL(S): mw-1, 11, 28, 16, 29s  
 DATE: 5-9-97  
 TIME: \_\_\_\_\_

ITEMS	OK	NA	NOTES
<b>PRIOR TO SAMPLING</b>			
Health & safety plan; reviewed; equipment ready.	✓		
Sample containers, coolers, received from laboratory; <u>ice</u> or ice pack and coolers ready.	✓		
Sampling equipment and supplies inventoried, clean and operational.	✓		
On-site client contact notified.	✓		
Condition of well noted.	✓		
Well area prepared for sampling; plastic placed around well; gasoline - powered pumps placed downwind.	✓		
Water - level measurements made and recorded on Water Sampling Log with other pertinent field information.	✓		
Field instruments calibrated; calibration recorded in field logbook	✓		PH 4.0, 7.0 + 10.0 SPL 700 + 3500 $\mu$ mhos/cm
Sample containers labelled; preservatives added, if necessary.	✓		By Lab
<b>DURING AND AFTER SAMPLING:</b>			
Three to five well volumes purged.	✓		3x if 10% stabilization of pH+SPL 5x max; if dries sample upon recovery
Sample collected using a bailer or pump as per sampling plan.	✓		disposable bailer
Measurement of field parameters recorded on Water Sampling Log and in field log book.	✓		
Sample containers filled according to collection protocol of analyses.	✓		
Field and trip blanks collected; replicates or split samples collected and recorded in field log book.	✓		Field Blank
Samples stored on ice in coolers.	✓		
Water Sampling Log and Chain-of-Custody Recorded completed	✓		
Reusable equipment decontaminated; non-reusable equipment disposed of in appropriate manner.	✓		
Well secured and locked.	✓		

Additional Comments: Kemron Lab Courier picked up Samples

Original to Field Project File; copy to Project Manager and to QA Officer.

Project Name: Ormet

Sample ID: MW-17

Project Number: Hm003.07

Replicate ID: \_\_\_\_\_

Site Location: Hannibal Ohio

Time Sampling Began: 0718

Sampling Date: 5-6-97 Weather: Sunny, breezy 50°

Time Sampling Completed: 0905

## EVACUATION DATA

Description of Measuring Point (MP) Top of PVC

MP Elevation \_\_\_\_\_

Diameter of Well Casing 2"

Total Sounded Depth of Well Below MP (TD) 77.91

Gallons to be Purged (19.4) 20

Depth to Water Below MP (DTW) 37.50

(3 WCVs, 5 WCVs, etc.) \_\_\_\_\_

Water Column (WC) in Well (TD-DTW) 40.41

Gallons per foot (GPF); from chart 0.16

Gallons in Well [WC x GPF] 6.47

= Well Casing Volume (WCV) \_\_\_\_\_

### GALLONS PER FOOT (gpf)

1" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
1 1/2" = 0.09	2 1/2" = 0.26	3 1/2" = 0.50	6" = 1.47

Evacuation Method and Material Disposable bailer with poly rope

## SAMPLING DATA AND FIELD PARAMETERS

Color: <u>Brown</u>	Odor: _____	Turbidity: <u>Slightly Turbid</u>
Temperature: (°C) <u>14.5</u>	<u>14.5</u>	<u>14.5</u>
pH: <u>(S.U.)</u>	<u>7.43</u>	<u>7.67</u>
Specific Conductance: ( $\mu$ mhos/cm) <u>500</u>	<u>497</u>	<u>488</u>

Sampling Method and Material(s): Disposable bailer with poly Rope

Parameters to be Analyzed

Container Description

From Lab X or HMI \_\_\_\_\_

Preservative

preserved by: Lab X or HMI \_\_\_\_\_

Dissolved Metals
500 mL Plastic
HNO<sub>3</sub> - field filtered
Cyanide (Total + Amenable)
500 mL Plastic
NaOH
pH, SpCond, Fluoride
250 mL Plastic
4°C

Sampling Personnel:

J Campbell, C Standard

Comments:

Project Name: Ormet

Sample ID: MW-34d

Project Number: Hm003.07

Replicate ID: \_\_\_\_\_

Site Location: Hannibal Ohio

Time Sampling Began: 0820

Sampling Date: 5-6-97 Weather: Very windy 40's

Time Sampling Completed: 0958

## EVACUATION DATA

Description of Measuring Point (MP) Top of PVC

MP Elevation \_\_\_\_\_

Diameter of Well Casing 2"

Total Sounded Depth of Well Below MP (TD) 68.24

Gallons to be Purged (15.7) 16

Depth to Water Below MP (DTW) 35.67

(3 WCVs, 5 WCVs, etc.)

Water Column (WC) in Well (TD-DTW) 32.57

Gallons per foot (GPF); from chart 0.16

Gallons in Well (WC x GPF) 5.21

= Well Casing Volume (WCV)

### GALLONS PER FOOT (gpf)

1" = 0.06 2" = 0.16 3" = 0.37 4" = 0.65

1 1/2" = 0.09 2 1/2" = 0.26 3 1/2" = 0.50 6" = 1.47

Evacuation Method and Material Disposable bailer with poly rope

## SAMPLING DATA AND FIELD PARAMETERS

Color: Light Brown

Odor: \_\_\_\_\_

Turbidity: Cloudy

Temperature: (°C)

14.5
14.5
14.5
14.5

pH: (S.U.)
7.27
7.39
7.43
7.43

Specific Conductance: (µmhos/cm)

507
496
491
492

Sampling Method and Material(s): Disposable bailer with poly Rope

Parameters to be Analyzed

Container Description

From Lab X or HMI \_\_\_\_\_

Preservative

preserved by: Lab X or HMI \_\_\_\_\_

Dissolved Metals
500 mL Plastic
HNO<sub>3</sub> - field filtered
Cyanide (Total + Amenable)
500 mL Plastic
NaOH
pH, SpCond, Fluoride
250 mL Plastic
4°C

Sampling Personnel:

J Campbell, C Standard

Comments:

Project Name: Ormet  
 Project Number: Hm003.07  
 Site Location: Hannibal Ohio  
 Sampling Date: 5-6-97 Weather: Very windy 40's

Sample ID: mw-34s  
 Replicate ID: \_\_\_\_\_  
 Time Sampling Began: 0905  
 Time Sampling Completed: 0925

**EVACUATION DATA**

 Description of Measuring Point (MP) Top of PVC

MP Elevation _____	Diameter of Well Casing <u>2"</u>
Total Sounded Depth of Well Below MP (TD) <u>49.35</u>	Gallons to be Purged <u>(6.1) 7</u>
Depth to Water Below MP (DTW) <u>36.72</u>	(3 WCVs, 5 WCVs, etc.)
Water Column (WC) in Well [TD-DTW] <u>12.63</u>	
Gallons per foot (GPF); from chart <u>0.16</u>	
Gallons in Well [WC x GPF] <u>2.02</u>	= Well Casing Volume (WCV)

GALLONS PER FOOT (gpf)				
1" = 0.08	2" = 0.16	3" = 0.37	4" = 0.65	
1 1/2" = 0.09	2 1/2" = 0.26	3 1/2" = 0.50	6" = 1.47	

 Evacuation Method and Material Disposable bailer with poly rope
**SAMPLING DATA AND  
FIELD PARAMETERS**

Color: <u>Brown</u>	Odor: _____	Turbidity: <u>Turbid (sl stained?)</u>
Temperature: (°C) <u>14</u>	<u>14</u>	<u>14</u>
pH: <u>(5.0)</u>	<u>7.38</u>	<u>7.41</u>
Specific Conductance: ( $\mu$ mhos/cm) <u>563</u>	<u>573</u>	<u>579</u>

 Sampling Method and Material(s): Disposable bailer with poly Rope

Parameters to be Analyzed	Container Description	Preservative
Dissolved Metals	From Lab <u>X</u> or HMI _____	preserved by: Lab <u>X</u> or HMI _____
<u>Cyanide (Total + Amenable)</u>	<u>500 mL Plastic</u>	<u>HNO<sub>3</sub> - field filtered</u>
<u>pH, SpCond, Fluoride</u>	<u>500 mL Plastic</u>	<u>NaOH</u>
	<u>250 mL Plastic</u>	<u>4°C</u>

 Sampling Personnel: J Campbell, C Standard

Comments: \_\_\_\_\_



Project Name: Ormet  
 Project Number: Hm003.07  
 Site Location: Hannibal Ohio  
 Sampling Date: 5-6-97 Weather: Windy 50°

Sample ID: MW-15  
 Replicate ID: MW-DUP-1  
 Time Sampling Began: 0935  
 Time Sampling Completed: 1016

## EVACUATION DATA

Description of Measuring Point (MP) Top of PVC  
 MP Elevation \_\_\_\_\_ Diameter of Well Casing 2"  
 Total Sounded Depth of Well Below MP (TD) 57.86 Gallons to be Purged (9.7) 10  
 Depth to Water Below MP (DTW) 37.75 (3 WCVs, 5 WCVs, etc.)  
 Water Column (WC) in Well (TD-DTW) 20.11  
 Gallons per foot (GPF); from chart 0.16  
 Gallons in Well [WC x GPF] 3.21 = Well Casing Volume (WCV)

GALLONS PER FOOT (gpf)				
1" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65	
1 1/2" = 0.09	2 1/2" = 0.26	3 1/2" = 0.50	6" = 1.47	

Evacuation Method and Material Disposable bailer with poly rope

## SAMPLING DATA AND FIELD PARAMETERS

Color: <u>Dark brown-black</u>	Odor: <u>1</u>	Turbidity: <u>Stained</u>
Temperature: (°C) <u>14.5</u>	<u>2</u>	<u>3</u>
pH: <u>(5.0)</u>	<u>7.37</u>	<u>7.39</u>
Specific Conductance: ( $\mu$ mhos/cm) <u>768</u>	<u>724</u>	<u>726</u>

Sampling Method and Material(s): Disposable bailer with poly Rope

Parameters to be Analyzed	Container Description	Preservative
Dissolved Metals	From Lab <u>X</u> or HMI _____	preserved by: Lab <u>X</u> or HMI _____
<u>Cyanide (Total + Amenable)</u>	<u>500 mL Plastic</u>	<u>HNO<sub>3</sub> - field filtered</u>
<u>pH, SpCond, Fluoride</u>	<u>500 mL Plastic</u>	<u>NaOH</u>
	<u>250 mL Plastic</u>	<u>4°C</u>

Sampling Personnel: J Campbell, C Standard  
 Comments: Color does not filter out

Project Name: Ormet  
 Project Number: Hm003.07  
 Site Location: Hannibal Ohio  
 Sampling Date: 5-6-97 Weather: Windy 40's

Sample ID: MW-36  
 Replicate ID: \_\_\_\_\_  
 Time Sampling Began: 1040  
 Time Sampling Completed: 1112

**EVACUATION DATA**

Description of Measuring Point (MP) Top of PVC  
 MP Elevation \_\_\_\_\_ Diameter of Well Casing 2"  
 Total Sounded Depth of Well Below MP (TD) 52.08 Gallons to be Purged (7.5) 7.5  
 Depth to Water Below MP (DTW) 36.52 (3 WCVs, 5 WCVs, etc.)  
 Water Column (WC) in Well (TD-DTW) 15.56  
 Gallons per foot (GPF); from chart 0.16  
 Gallons in Well (WC x GPF) 2.5 = Well Casing Volume (WCV)

GALLONS PER FOOT (gpf)				
1 1/2" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65	
1 3/4" = 0.09	2 1/2" = 0.26	3 1/2" = 0.50	6" = 1.47	

Evacuation Method and Material Disposable bailer with poly rope

**SAMPLING DATA AND  
FIELD PARAMETERS**

Color: <u>Black-dark brown</u>	Odor: _____	Turbidity: <u>Very stained and cloudy</u>
Temperature: (°C) <u>16</u>	<u>15.5</u>	<u>15.5</u>
pH: <u>(S.U.)</u>	<u>9.61</u>	<u>9.64</u>
Specific Conductance: ( $\mu$ mhos/cm) <u>3350</u>	<u>3380</u>	<u>3290</u>

Sampling Method and Material(s): Disposable bailer with poly Rope

Parameters to be Analyzed	Container Description	Preservative
	From Lab <u>X</u> or HMI _____	preserved by: Lab <u>X</u> or HMI _____
<u>Dissolved Metals</u>	<u>500 mL Plastic</u>	<u>HNO<sub>3</sub> - field filtered</u>
<u>Cyanide (Total + Amenable)</u>	<u>500 mL Plastic</u>	<u>NaOH</u>
<u>pH, SpCond, Fluoride</u>	<u>250 mL Plastic</u>	<u>4°C</u>
_____	_____	_____
_____	_____	_____

Sampling Personnel: J Campbell, C Standard  
 Comments: Color does not filter out

Project Name: Ormet

 Sample ID: MW-32

 Project Number: Hm003.07

 Replicate ID:     

 Site Location: Hannibal Ohio

 Time Sampling Began: 1130

 Sampling Date: 5-7-97 Weather: Sunny, windy 50

 Time Sampling Completed: 1200
**EVACUATION DATA**

 Description of Measuring Point (MP) Top of PVC

 MP Elevation      Diameter of Well Casing 2"

 Total Sounded Depth of Well Below MP (TD) 57.18 Gallons to be Purged (8.2) 8.5

 Depth to Water Below MP (DTW) 40.10 (3 WCVs, 5 WCVs, etc.)

 Water Column (WC) in Well (TD-DTW) 17.08

 Gallons per foot (GPF); from chart 0.16

 Gallons in Well [WC x GPF] 2.73 = Well Casing Volume (WCV)

**GALLONS PER FOOT (gpf)**

1" = 0.06 2" = 0.18 3" = 0.37 4" = 0.65

1 1/2" = 0.09 2 1/2" = 0.26 3 1/2" = 0.50 6" = 1.47

 Evacuation Method and Material Disposable bailer with poly rope
**SAMPLING DATA AND  
FIELD PARAMETERS**

 Color: Brown Odor:      Turbidity: Stained (not cloudy)

 Temperature: (°C) 15.5 15.5 15.5 15.5

 pH: (5.0) 8.37 8.55 8.64 8.71

 Specific Conductance: (µmhos/cm) 590 633 670 697

 Sampling Method and Material(s): Disposable bailer with poly Rope
**Parameters to be Analyzed**
**Container Description**
**Preservative**

 From Lab X or HMI     

 preserved by: Lab X or HMI     
Dissolved Metals 500 mL Plastic HNO<sub>3</sub> - field filtered
Cyanide (Total + Amenable) 500 mL Plastic NaOH
pH, SpCond, Fluoride 250 mL Plastic 4°C

 Sampling Personnel: J Campbell, C Standard

 Comments: Color does not completely filter out

Project Name: Ormet

Sample ID: MW-35

Project Number: Hm003.07

Replicate ID: \_\_\_\_\_

Site Location: Hannibal Ohio

Time Sampling Began: 1236

Sampling Date: 5-6-97

Weather: Sunny, breezy 50°

Time Sampling Completed: 1310

## EVACUATION DATA

Description of Measuring Point (MP) Top of PVC

MP Elevation \_\_\_\_\_

Diameter of Well Casing 2"

Total Sounded Depth of Well Below MP (TD) 46.70

Gallons to be Purged (5) 7

Depth to Water Below MP (DTW) 36.37

(3 WCVs, 5 WCVs, etc.)

Water Column (WC) in Well (TD-DTW) 10.33

Gallons per foot (GPF); from chart 0.16

Gallons in Well (WC x GPF) 1.65

= Well Casing Volume (WCV)

### GALLONS PER FOOT (gpf)

1 1/2" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
1 1/2" = 0.09	2 1/2" = 0.26	3 1/2" = 0.50	6" = 1.47

Evacuation Method and Material Disposable bailer with poly rope

## SAMPLING DATA AND FIELD PARAMETERS

Color: <u>Brown</u>	Odor: _____			Turbidity: <u>Stained and Cloudy</u>	
Temperature: (°C) <u>15.5</u>	<u>15.5</u>	<u>15.5</u>	<u>15.5</u>	<u>15.5</u>	<u>15.5</u>
pH: <u>(5.0)</u>	<u>8.91</u>	<u>9.09</u>	<u>9.19</u>	<u>9.30</u>	<u>9.47</u>
Specific Conductance: ( $\mu$ mhos/cm) <u>506</u>	<u>635</u>	<u>709</u>	<u>770</u>	<u>900</u>	

Sampling Method and Material(s): Disposable bailer with poly Rope

Parameters to be Analyzed

Container Description

Preservative

From Lab X or HMI \_\_\_\_\_

preserved by: Lab X or HMI \_\_\_\_\_

Dissolved Metals
500 mL Plastic
HNO<sub>3</sub> - field filtered
Cyanide (Total + Amenable)
500 mL Plastic
NaOH
pH, SpCond, Fluoride
250 mL Plastic
4°C

Sampling Personnel:

J Campbell, C Standard

Comments:

Color does not filter out; well dried to 1/4 full bailers after 3 well volumes (5gal).

Project Name: Ormet

 Sample ID: ML-37

 Project Number: Hm003.07

Replicate ID: \_\_\_\_\_

 Site Location: Hannibal Ohio

 Time Sampling Began: 1320

 Sampling Date: 5-6-97 Weather: Cloudy Windy 50°

 Time Sampling Completed: 1348
**EVACUATION DATA**

 Description of Measuring Point (MP) Top of PVC

MP Elevation \_\_\_\_\_

 Diameter of Well Casing 2"

 Total Sounded Depth of Well Below MP (TD) 36.98

 Gallons to be Purged (8.5) 9

 Depth to Water Below MP (DTW) 19.40

(3 WCVs, 5 WCVs, etc.)

 Water Column (WC) in Well (TD-DTW) 17.58

 Gallons per foot (GPF); from chart 0.16

 Gallons in Well (WC x GPF) 2.81

= Well Casing Volume (WCV)

**GALLONS PER FOOT (gpf)**

1" = 0.06 2" = 0.16 3" = 0.37 4" = 0.65

1 1/2" = 0.09 2 1/2" = 0.26 3 1/2" = 0.50 6" = 1.47

 Evacuation Method and Material Disposable bailer with poly rope
**SAMPLING DATA AND  
FIELD PARAMETERS**

 Color: Dark brown

Odor: \_\_\_\_\_

 Turbidity: Stained and Turbid

Temperature: (°C)

14.5
14.5
14.5
14.5

 pH: (5.0)
9.09
9.09
9.08
9.07

 Specific Conductance: ( $\mu\text{mhos/cm}$ )

843
867
850
846

 Sampling Method and Material(s): Disposable bailer with poly Rope

Parameters to be Analyzed

Container Description

 From Lab X or HMI \_\_\_\_\_

Preservative

 preserved by: Lab X or HMI \_\_\_\_\_

Dissolved Metals
500 mL Plastic
HNO<sub>3</sub> - field filtered
Cyanide (Total + Amenable)
500 mL Plastic
NaOH
pH, SpCond, Fluoride
250 mL Plastic
4°C

Sampling Personnel:

J Campbell, C Standard

Comments:

Color does not filter out

Project Name: Ormet

 Sample ID: MW-41

 Project Number: Hm003.07

Replicate ID: \_\_\_\_\_

 Site Location: Hannibal Ohio

 Time Sampling Began: 1410

 Sampling Date: 5-6-97 Weather: Cloudy, windy 50

 Time Sampling Completed: 1500
**EVACUATION DATA**

 Description of Measuring Point (MP) Top of PVC

 MP Elevation \_\_\_\_\_ Diameter of Well Casing 2"

 Total Sounded Depth of Well Below MP (TD) 62.26 Gallons to be Purged (23.5) 24

 Depth to Water Below MP (DTW) 13.50 (3 WCVs, 5 WCVs, etc.)

 Water Column (WC) in Well (TD-DTW) 48.76

 Gallons per foot (GPF); from chart 0.16

 Gallons in Well [WC x GPF] 7.8 = Well Casing Volume (WCV)

**GALLONS PER FOOT (gpf)**

1" = 0.06 2" = 0.16 3" = 0.37 4" = 0.65

1 1/2" = 0.09 2 1/2" = 0.26 3 1/2" = 0.50 6" = 1.47

 Evacuation Method and Material Disposable bailer with poly rope
**SAMPLING DATA AND**
**FIELD PARAMETERS**

 Color: Brown Odor: \_\_\_\_\_ Turbidity: V Cloudy

 Temperature: (°C) 15 15 15 15

 pH: (S.U.) 6.99 6.99 6.96 6.98

 Specific Conductance: (µmhos/cm) 352 343 347 357

 Sampling Method and Material(s): Disposable bailer with poly Rope
**Parameters to be Analyzed**
**Container Description**
**Preservative**

 From Lab X or HMI \_\_\_\_\_

 preserved by: Lab X or HMI \_\_\_\_\_

Dissolved Metals 500 mL Plastic HNO<sub>3</sub> - field filtered
Cyanide (Total + Amenable) 500 mL Plastic NaOH
pH, SpCond, Fluoride 250 mL Plastic 4°C

 Sampling Personnel: J Campbell, C Standard

Comments: \_\_\_\_\_

Project Name: Ormet  
 Project Number: Hm003.07  
 Site Location: Hannibal Ohio  
 Sampling Date: 5-7-97 Weather: foggy 40°

Sample ID: MW-39d  
 Replicate ID: \_\_\_\_\_  
 Time Sampling Began: 0745  
 Time Sampling Completed: 0830

**EVACUATION DATA**

Description of Measuring Point (MP) Top of PVC

MP Elevation	Diameter of Well Casing	<u>2"</u>
Total Sounded Depth of Well Below MP (TD) <u>80.21</u>	Gallons to be Purged	<u>(19) 19</u>
Depth to Water Below MP (DTW) <u>40.82</u>	(3 WCVs, 5 WCVs, etc.)	
Water Column (WC) in Well (TD-DTW) <u>39.39</u>		
Gallons per foot (GPF); from chart <u>0.16</u>		
Gallons in Well [WC x GPF] <u>6.3</u>	= Well Casing Volume (WCV)	

GALLONS PER FOOT (gpf)				
1 1/2" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65	
1 3/4" = 0.09	2 1/2" = 0.26	3 1/2" = 0.50	6" = 1.47	

Evacuation Method and Material Disposable bailer with poly rope

**SAMPLING DATA AND  
FIELD PARAMETERS**

Color: <u>Light Tan</u>	Odor:	Turbidity: <u>Slightly Cloudy</u>
Temperature: (°C) <u>15</u>	<u>15</u>	<u>15</u>
pH: <u>(S.U.)</u>	<u>7.55</u>	<u>7.66</u>
Specific Conductance: ( $\mu$ mhos/cm) <u>445</u>	<u>454</u>	<u>457</u>

Sampling Method and Material(s): Disposable bailer with poly Rope

Parameters to be Analyzed	Container Description	Preservative
Dissolved Metals	From Lab <u>X</u> or HMI _____ <u>500 mL Plastic</u>	preserved by: Lab <u>X</u> or HMI _____ <u>HNO<sub>3</sub> - field filtered</u>
Cyanide (Total + Amenable)	<u>500 mL Plastic</u>	<u>NaOH</u>
pH, SpCond, Fluoride	<u>250 mL Plastic</u>	<u>4°C</u>

Sampling Personnel: J Campbell, C Standard

Comments: \_\_\_\_\_

Project Name: Ormet  
 Project Number: Hm003.07  
 Site Location: Hannibal Ohio  
 Sampling Date: 5-7-97 Weather: Foggy 40°

Sample ID: ML-395  
 Replicate ID: \_\_\_\_\_  
 Time Sampling Began: 0840  
 Time Sampling Completed: 0915

## EVACUATION DATA

Description of Measuring Point (MP) Top of PVC  
 MP Elevation \_\_\_\_\_ Diameter of Well Casing 2"  
 Total Sounded Depth of Well Below MP (TD) 60.23 Gallons to be Purged (10.2) 10.5  
 Depth to Water Below MP (DTW) 41.10 (3 WCVs, 5 WCVs, etc.)  
 Water Column (WC) in Well [TD-DTW] 21.13  
 Gallons per foot (GPF); from chart 0.16  
 Gallons in Well [WC x GPF] 3.4 = Well Casing Volume (WCV)

GALLONS PER FOOT (gpf)				
1" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65	
1 1/2" = 0.09	2 1/2" = 0.26	3 1/2" = 0.50	6" = 1.47	

Evacuation Method and Material Disposable bailer with poly rope

## SAMPLING DATA AND FIELD PARAMETERS

Color: Amber brown Odor: \_\_\_\_\_ Turbidity: stained  
 Temperature: (°C) 15 15 15 15 Final  
 pH: (S.U.) 9.22 9.23 9.23 9.20  
 Specific Conductance: (µmhos/cm) 5760 5550 5770 5500

Sampling Method and Material(s): Disposable bailer with poly Rope

Parameters to be Analyzed	Container Description	Preservative
Dissolved Metals	From Lab <u>X</u> or HMI _____ 500 mL Plastic	preserved by: Lab <u>X</u> or HMI _____ <u>HNO<sub>3</sub> - field filtered</u>
Cyanide (Total + Amenable)	500 mL Plastic	<u>NaOH</u>
pH, SpCond, Fluoride	250 mL Plastic	<u>4°C</u>

Sampling Personnel: J Campbell, C Standard  
 Comments: Color does not filter out



Project Name: Ormet  
 Project Number: Hm003.07  
 Site Location: Hannibal Ohio  
 Sampling Date: 5-7-97 Weather: Sunny 40's

Sample ID: MW-12  
 Replicate ID: \_\_\_\_\_  
 Time Sampling Began: 0930  
 Time Sampling Completed: 1015

**EVACUATION DATA**

Description of Measuring Point (MP) Top of PVC  
 MP Elevation \_\_\_\_\_ Diameter of Well Casing 2"  
 Total Sounded Depth of Well Below MP (TD) 68.24 Gallons to be Purged (21.6) 22  
 Depth to Water Below MP (DTW) 23.30 (3 WCVs, 5 WCVs, etc.)  
 Water Column (WC) in Well (TD-DTW) 44.94  
 Gallons per foot (GPF); from chart 0.16  
 Gallons in Well (WC x GPF) 7.2 = Well Casing Volume (WCV)

GALLONS PER FOOT (gpf)				
1" = 0.08	2" = 0.16	3" = 0.37	4" = 0.65	
1 1/2" = 0.09	2 1/2" = 0.26	3 1/2" = 0.50	6" = 1.47	

Evacuation Method and Material Disposable bailer with poly rope

**SAMPLING DATA AND  
FIELD PARAMETERS**

	Color:	Odor:	Turbidity:
Color: <u>None</u>			<u>Clear</u>
Temperature: <u>(50)</u>	<u>15.5</u>	<u>15.5</u>	<u>15.5</u>
pH: <u>(5.0)</u>	<u>7.57</u>	<u>7.66</u>	<u>7.70</u>
Specific Conductance: <u>(µmhos/cm)</u>	<u>428</u>	<u>422</u>	<u>422</u>

Sampling Method and Material(s): Disposable bailer with poly Rope

Parameters to be Analyzed	Container Description	Preservative
	From Lab <u>X</u> or HMI _____	preserved by: Lab <u>X</u> or HMI _____
<u>Dissolved Metals</u>	<u>500 mL Plastic</u>	<u>HNO<sub>3</sub> - field filtered</u>
<u>Cyanide (Total + Amenable)</u>	<u>500 mL Plastic</u>	<u>NaOH</u>
<u>pH, SpCond, Fluoride</u>	<u>250 mL Plastic</u>	<u>4°C</u>

Sampling Personnel: J Campbell, C Standard

Comments: \_\_\_\_\_

Project Name: Ormet  
 Project Number: Hm003.07  
 Site Location: Hannibal Ohio  
 Sampling Date: 5-7-97 Weather: Sunny 50's

Sample ID: MW-42d  
 Replicate ID: \_\_\_\_\_  
 Time Sampling Began: 1045  
 Time Sampling Completed: 1138

## EVACUATION DATA

Description of Measuring Point (MP) Top of PVC  
 MP Elevation \_\_\_\_\_ Diameter of Well Casing 2"  
 Total Sounded Depth of Well Below MP (TD) 85.10 Gallons to be Purged (217) 22  
 Depth to Water Below MP (DTW) 39.93 (3 WCVs, 5 WCVs, etc.)  
 Water Column (WC) in Well (TD-DTW) 45.17  
 Gallons per foot (GPF); from chart 0.16  
 Gallons in Well (WC x GPF) 7.23 = Well Casing Volume (WCV)

GALLONS PER FOOT (gpf)				
1 1/2" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65	
1 3/4" = 0.09	2 1/2" = 0.26	3 1/2" = 0.50	6" = 1.47	

Evacuation Method and Material Disposable bailer with poly rope

## SAMPLING DATA AND FIELD PARAMETERS

Color: None Odor: \_\_\_\_\_ Turbidity: Clear  
 Temperature: (°C) 15 15 15 15  
 pH: (S.U.) 7.83 7.89 8.00 7.99  
 Specific Conductance: ( $\mu$ mhos/cm) 473 468 466 468

Sampling Method and Material(s): Disposable bailer with poly Rope

Parameters to be Analyzed	Container Description	Preservative
Dissolved Metals	From Lab <u>X</u> or HMI _____ 500 mL Plastic	preserved by: Lab <u>X</u> or HMI _____ <u>HNO<sub>3</sub> - field filtered</u>
Cyanide (Total + Amenable)	500 mL Plastic	<u>NaOH</u>
pH, SpCond, Fluoride	250 mL Plastic	<u>4°C</u>

Sampling Personnel: J Campbell, C Standard

Comments: \_\_\_\_\_

Project Name: Ormet

 Sample ID: MW-42s

 Project Number: Hm003.07

Replicate ID: \_\_\_\_\_

 Site Location: Hannibal Ohio

 Time Sampling Began: 1142

 Sampling Date: 5-7-97 Weather: Sunny 60

 Time Sampling Completed: 1205
**EVACUATION DATA**

 Description of Measuring Point (MP) Top of PVC

 MP Elevation \_\_\_\_\_ Diameter of Well Casing 2"

 Total Sounded Depth of Well Below MP (TD) 52.30 Gallons to be Purged (5.9) 6

 Depth to Water Below MP (DTW) 40.04 (3 WCVs, 5 WCVs, etc.)

 Water Column (WC) in Well (TD-DTW) 12.26

 Gallons per foot (GPF); from chart 0.16

 Gallons in Well (WC x GPF) 1.96 = Well Casing Volume (WCV)

**GALLONS PER FOOT (gpf)**

1" = 0.06 2" = 0.16 3" = 0.37 4" = 0.65

1 1/2" = 0.09 2 1/2" = 0.26 3 1/2" = 0.50 6" = 1.47

 Evacuation Method and Material Disposable bailer with poly rope
**SAMPLING DATA AND  
FIELD PARAMETERS**

 Color: Light Tan Odor: \_\_\_\_\_ Turbidity: Slightly Cloudy

 Temperature: (°C) 16 15 15 15

 pH: (S.U.) 8.40 8.52 8.52 8.57

 Specific Conductance: (µmhos/cm) 1190 1325 1340 1350

 Sampling Method and Material(s): Disposable bailer with poly Rope

Parameters to be Analyzed	Container Description	Preservative
	From Lab <u>X</u> or HMI _____	preserved by: Lab <u>X</u> or HMI _____

<u>Dissolved Metals</u>	<u>500 mL Plastic</u>	<u>HNO<sub>3</sub> - field filtered</u>
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<u>Cyanide (Total + Amenable)</u>	<u>500 mL Plastic</u>	<u>NaOH</u>
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<u>pH, SpCond, Fluoride</u>	<u>250 mL Plastic</u>	<u>4°C</u>
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 Sampling Personnel: J Campbell, C Standard

Comments: \_\_\_\_\_

Project Name: Ormet

 Sample ID: MW-19

 Project Number: Hm003.07

Replicate ID: \_\_\_\_\_

 Site Location: Hannibal Ohio

 Time Sampling Began: 1245

 Sampling Date: 5-7-97 Weather: Sunny 60°

 Time Sampling Completed: 1325
**EVACUATION DATA**

 Description of Measuring Point (MP) Top of PVC

 MP Elevation \_\_\_\_\_ Diameter of Well Casing 2"

 Total Sounded Depth of Well Below MP (TD) 65.20 Gallons to be Purged (11.4) 12

 Depth to Water Below MP (DTW) 41.50 (3 WCVs, 5 WCVs, etc.)

 Water Column (WC) in Well [TD-DTW] 23.70

 Gallons per foot (GPF); from chart 0.16

 Gallons in Well [WC x GPF] 3.8 = Well Casing Volume (WCV)

**GALLONS PER FOOT (gpf)**

1" = 0.06 2" = 0.16 3" = 0.37 4" = 0.65

1 1/2" = 0.09 2 1/2" = 0.26 3 1/2" = 0.50 6" = 1.47

 Evacuation Method and Material Disposable bailer with poly rope
**SAMPLING DATA AND  
FIELD PARAMETERS**

 Color: Brown Odor: \_\_\_\_\_ Turbidity: Cloudy

 Temperature: (°C) 13.5 13.5 13.5 13.5

 pH: (5.0) 7.40 7.49 7.52 7.50

 Specific Conductance: (µmhos/cm) 443 437 433 431

 Sampling Method and Material(s): Disposable bailer with poly Rope
**Parameters to be Analyzed**
**Container Description**
**Preservative**

 From Lab X or HMI \_\_\_\_\_

 preserved by: Lab X or HMI \_\_\_\_\_

Dissolved Metals
500 mL Plastic
HNO<sub>3</sub> - field filtered
Cyanide (Total + Amenable)
500 mL Plastic
NaOH
pH, SpCond, Fluoride
250 mL Plastic
4°C

Sampling Personnel:

J Campbell, C Standard

Comments:

Project Name: Ormet  
 Project Number: Hm003.07  
 Site Location: Hannibal Ohio  
 Sampling Date: 5-7-97 Weather: Sunny 60°

Sample ID: MW-40d  
 Replicate ID:       
 Time Sampling Began: 1345  
 Time Sampling Completed: 1435

**EVACUATION DATA**

Description of Measuring Point (MP) Top of PVC

MP Elevation	<u>    </u>	Diameter of Well Casing	<u>2"</u>
Total Sounded Depth of Well Below MP (TD)	<u>90.40</u>	Gallons to be Purged	<u>(18.6) 19</u>
Depth to Water Below MP (DTW)	<u>51.77</u>	(3 WCVs, 5 WCVs, etc.)	
Water Column (WC) in Well [TD-DTW]	<u>38.63</u>		
Gallons per foot (GPF); from chart	<u>0.16</u>		
Gallons in Well [WC x GPF]	<u>6.18</u>	= Well Casing Volume (WCV)	

GALLONS PER FOOT (gpf)				
1" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65	
1 1/2" = 0.09	2 1/2" = 0.26	3 1/2" = 0.50	6" = 1.47	

Evacuation Method and Material Disposable bailer with poly rope

**SAMPLING DATA AND  
FIELD PARAMETERS**

Color: <u>None</u>	Odor: <u>2</u>	Turbidity: <u>Clear</u>
Temperature: (°C) <u>15.5</u>	<u>15.5</u>	<u>15.5</u>
pH: <u>(5.0)</u>	<u>7.78</u>	<u>7.85</u>
Specific Conductance: ( $\mu$ mhos/cm) <u>1340</u>	<u>1360</u>	<u>1359</u>

Sampling Method and Material(s): Disposable bailer with poly rope

Parameters to be Analyzed	Container Description	Preservative
<u>Dissolved Metals</u>	<u>500 mL Plastic</u>	<u>HNO<sub>3</sub> - field filtered</u>
<u>Cyanide (Total + Amenable)</u>	<u>500 mL Plastic</u>	<u>NaOH</u>
<u>pH, SpCond, Fluoride</u>	<u>250 mL Plastic</u>	<u>4°C</u>

Sampling Personnel: J Campbell, C Standard

Comments:

Project Name: Ormet

 Sample ID: MW-40s

 Project Number: Hm003.07

 Replicate ID:     

 Site Location: Hannibal Ohio

 Time Sampling Began: 1437

 Sampling Date: 5- -97 Weather:     

 Time Sampling Completed: 1504
**EVACUATION DATA**

 Description of Measuring Point (MP) Top of PVC

 MP Elevation     

 Diameter of Well Casing 2"

 Total Sounded Depth of Well Below MP (TD) 70.40

 Gallons to be Purged (8.9) 9

 Depth to Water Below MP (DTW) 51.97

(3 WCVs, 5 WCVs, etc.)

 Water Column (WC) in Well [TD-DTW] 18.43

 Gallons per foot (GPF); from chart 0.16

 Gallons in Well [WC x GPF] 2.95

= Well Casing Volume (WCV)

**GALLONS PER FOOT (gpf)**

1" = 0.06    2" = 0.18    3" = 0.37    4" = 0.65

1 1/2" = 0.09    2 1/2" = 0.26    3 1/2" = 0.50    6" = 1.47

 Evacuation Method and Material Disposable bailer with poly rope
**SAMPLING DATA AND  
FIELD PARAMETERS**

 Color: Brown Odor:      Turbidity: Cloudy

 Temperature: (°C) 15.5 15.5 15.5 15.5

 pH: (5.0) 8.04 8.06 8.06 8.07

 Specific Conductance: (µmhos/cm) 1385 1400 1416 1417

 Sampling Method and Material(s): Disposable bailer with poly Rope

Parameters to be Analyzed

Container Description

Preservative

 From Lab X or HMI     

 preserved by: Lab X or HMI     
Dissolved Metals
500 mL Plastic
HNO<sub>3</sub> - field filtered
Cyanide (Total + Amenable)
500 mL Plastic
NaOH
pH, SpCond, Fluoride
250 mL Plastic
4°C

Sampling Personnel:

J Campbell, C Standard

Comments:

Project Name: Ormet

 Sample ID: MW-29d

 Project Number: Hm003.07

 Replicate ID:     

 Site Location: Hannibal Ohio

 Time Sampling Began: 1515

 Sampling Date: 5-7-97 Weather: Sunny, windy 60°

 Time Sampling Completed: 1600
**EVACUATION DATA**

 Description of Measuring Point (MP) Top of PVC

 MP Elevation     

 Diameter of Well Casing 2"

 Total Sounded Depth of Well Below MP (TD) 81.98

 Gallons to be Purged (20.3) 20.5

 Depth to Water Below MP (DTW) 39.70

(3 WCVs, 5 WCVs, etc.)

 Water Column (WC) in Well (TD-DTW) 42.28

 Gallons per foot (GPF); from chart 0.16

 Gallons in Well (WC x GPF) 6.76

= Well Casing Volume (WCV)

**GALLONS PER FOOT (gpf)**

1" = 0.06 2" = 0.16 3" = 0.37 4" = 0.65

1 1/2" = 0.09 2 1/2" = 0.26 3 1/2" = 0.50 6" = 1.47

 Evacuation Method and Material Disposable bailer with poly rope
**SAMPLING DATA AND  
FIELD PARAMETERS**

 Color: None Odor:      Turbidity: Clear

 Temperature: (°C) 15.5 15.5 15.5 15.5

 pH: (S.U.) 7.47 7.75 7.91 7.90

 Specific Conductance: ( $\mu\text{mhos/cm}$ ) 527 481 479 479

 Sampling Method and Material(s): Disposable bailer with poly Rope

Parameters to be Analyzed

Container Description

Preservative

 From Lab X or HMI     

 preserved by: Lab X or HMI     
Dissolved Metals
500 mL Plastic
HNO<sub>3</sub> - field filtered
Cyanide (Total + Amenable)
500 mL Plastic
NaOH
pH, SpCond, Fluoride
250 mL Plastic
4°C

Sampling Personnel:

J Campbell, C Standard

Comments:

Project Name: Ormet  
 Project Number: Hm003.07  
 Site Location: Hannibal Ohio  
 Sampling Date: 5-8-97 Weather: 50° Lt Rain

Sample ID: MW-31  
 Replicate ID: MW-Dup-3  
 Time Sampling Began: 0740  
 Time Sampling Completed: 0825

**EVACUATION DATA**

Description of Measuring Point (MP) Top of PVC  
 MP Elevation \_\_\_\_\_ Diameter of Well Casing 2"  
 Total Sounded Depth of Well Below MP (TD) 67.51 Gallons to be Purged (9.9) 10  
 Depth to Water Below MP (DTW) 46.92 (3 WCVs, 5 WCVs, etc.)  
 Water Column (WC) in Well (TD-DTW) 20.59  
 Gallons per foot (GPF); from chart 0.16  
 Gallons in Well [WC x GPF] 3.30 = Well Casing Volume (WCV)

GALLONS PER FOOT (gpf)				
1" = 0.08	2" = 0.16	3" = 0.37	4" = 0.65	
1 1/2" = 0.09	2 1/2" = 0.26	3 1/2" = 0.50	6" = 1.47	

Evacuation Method and Material Disposable bailer with poly rope

**SAMPLING DATA AND  
FIELD PARAMETERS**

Color: <u>Dark brown-black</u>	Odor: _____	Turbidity: <u>Very Stained</u>
Temperature: (°C) <u>15</u>	<u>15</u>	<u>15</u>
pH: <u>(5.0)</u>	<u>9.68</u>	<u>9.72</u>
Specific Conductance: ( $\mu$ mhos/cm) <u>2140</u>	<u>2200</u>	<u>2200</u>

Sampling Method and Material(s): Disposable bailer with poly Rope

Parameters to be Analyzed	Container Description	Preservative
Dissolved Metals	From Lab <u>X</u> or HMI _____	preserved by: Lab <u>X</u> or HMI _____
Cyanide (Total + Amenable)	<u>500 mL Plastic</u>	<u>HNO<sub>3</sub> - field filtered</u>
pH, SpCond, Fluoride	<u>500 mL Plastic</u>	<u>NaOH</u>
PCE	<u>250 mL Plastic</u>	<u>4°C</u>
	<u>2x40 mL Glass</u>	<u>HCl</u>

Sampling Personnel: J Campbell, C Standard

Comments: Color does not filter out



Project Name: Ormet  
 Project Number: Hm003.07  
 Site Location: Hannibal Ohio  
 Sampling Date: 5-8-97 Weather: Overcast 50°

Sample ID: MLJ-18  
 Replicate ID: \_\_\_\_\_  
 Time Sampling Began: 0858  
 Time Sampling Completed: 0940

## EVACUATION DATA

Description of Measuring Point (MP) Top of PVC  
 MP Elevation \_\_\_\_\_ Diameter of Well Casing 2"  
 Total Sounded Depth of Well Below MP (TD) 58.00 Gallons to be Purged (8.7) 9  
 Depth to Water Below MP (DTW) 39.84 (3 WCVs, 5 WCVs, etc.)  
 Water Column (WC) in Well [TD-DTW] 18.16  
 Gallons per foot (GPF); from chart 0.16  
 Gallons in Well [WC x GPF] 2.9 = Well Casing Volume (WCV)

GALLONS PER FOOT (gpf)				
1 1/2" = 0.08	2" = 0.16	3" = 0.37	4" = 0.65	
1 1/2" = 0.09	2 1/2" = 0.26	3 1/2" = 0.50	6" = 1.47	

Evacuation Method and Material Disposable bailer with poly rope

## SAMPLING DATA AND FIELD PARAMETERS

Color: Dark brown-black Odor: Slight wispy sheer Turbidity: Very stained and Cloudy  
 Temperature: (°C) 15 15 15 15  
 pH: (S.U.) 9.57 9.60 9.58 9.58  
 Specific Conductance: (µmhos/cm) 4280 4270 4130 4110

Sampling Method and Material(s): Disposable bailer with poly Rope

Parameters to be Analyzed	Container Description	Preservative
Dissolved Metals	500 mL Plastic	HNO <sub>3</sub> - field filtered
Cyanide (Total + Amenable)	500 mL Plastic	NaOH
pH, SpCond, Fluoride	250 mL Plastic	4°C
PCE	2x40 mL Glass	HCl

Sampling Personnel: J Campbell, C Standard

Comments: Color does not filter out. Very hard to filter

Project Name: Ormet  
 Project Number: Hm003.07  
 Site Location: Hannibal Ohio  
 Sampling Date: 5-8-97 Weather: Overcast 48°

Sample ID: MW-30  
 Replicate ID: \_\_\_\_\_  
 Time Sampling Began: 0947  
 Time Sampling Completed: 1015

**EVACUATION DATA**

Description of Measuring Point (MP) Top of PVC  
 MP Elevation \_\_\_\_\_ Diameter of Well Casing 2"  
 Total Sounded Depth of Well Below MP (TD) 60.41 Gallons to be Purged (5.5) 6  
 Depth to Water Below MP (DTW) 49.02 (3 WCVs, 5 WCVs, etc.)  
 Water Column (WC) in Well (TD-DTW) 11.39  
 Gallons per foot (GPF); from chart 0.16  
 Gallons in Well [WC x GPF] 1.82 = Well Casing Volume (WCV)

GALLONS PER FOOT (gpf)				
1 1/2" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65	
1 3/4" = 0.09	2 1/2" = 0.26	3 1/2" = 0.50	6" = 1.47	

Evacuation Method and Material Disposable bailer with poly rope

**SAMPLING DATA AND  
FIELD PARAMETERS**

Color: Brown Odor: \_\_\_\_\_ Turbidity: Turbid  
 Temperature: (°C) 15 15 15 15 <sup>final</sup>  
 pH: (5.0) 6.33 6.39 6.45 6.47  
 Specific Conductance: ( $\mu\text{mhos/cm}$ ) 356 338 333 334

Sampling Method and Material(s): Disposable bailer with poly Rope

Parameters to be Analyzed	Container Description From Lab <u>X</u> or HMI _____	Preservative preserved by: Lab <u>X</u> or HMI _____
<u>Dissolved Metals</u>	<u>500 mL Plastic</u>	<u>HNO<sub>3</sub> - field filtered</u>
<u>Cyanide (Total + Amenable)</u>	<u>500 mL Plastic</u>	<u>NaOH</u>
<u>pH, SpCond, Fluoride</u>	<u>250 mL Plastic</u>	<u>4°C</u>
<u>PCE</u>	<u>2x40 mL Glass</u>	<u>HCL</u>

Sampling Personnel:

Comments:

J Campbell, C Standard  
At ~ 5 gallons well dries to 1/4 full bailers

Project Name: Ormet  
 Project Number: Hm003.07  
 Site Location: Hannibal Ohio  
 Sampling Date: 5-8-97 Weather: Overcast 40's

Sample ID: MW-5  
 Replicate ID: \_\_\_\_\_  
 Time Sampling Began: 1033  
 Time Sampling Completed: 1120

## EVACUATION DATA

Description of Measuring Point (MP) Top of PVC  
 MP Elevation \_\_\_\_\_ Diameter of Well Casing 2"  
 Total Sounded Depth of Well Below MP (TD) 91.88 Gallons to be Purged (12.8) 13  
 Depth to Water Below MP (DTW) 65.30 (3 WCVs, 5 WCVs, etc.)  
 Water Column (WC) in Well [TD-DTW] 26.58  
 Gallons per foot (GPF); from chart 0.16  
 Gallons in Well [WC x GPF] 4.25 = Well Casing Volume (WCV)

GALLONS PER FOOT (gpf)				
1 1/2" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65	
1 3/4" = 0.09	2 1/2" = 0.26	3 1/2" = 0.50	6" = 1.47	

Evacuation Method and Material Disposable bailer with poly rope

## SAMPLING DATA AND FIELD PARAMETERS

Color: Brown Odor: \_\_\_\_\_ Turbidity: stained  
 Temperature: (°C) 16 16 16 16  
 pH: (5.0,) 9.15 9.13 9.13 9.20  
 Specific Conductance: ( $\mu\text{mhos/cm}$ ) 1325 1320 1303 1318

Sampling Method and Material(s): Disposable bailer with poly Rope

Parameters to be Analyzed	Container Description From Lab <u>X</u> or HMI _____	Preservative preserved by: Lab <u>X</u> or HMI _____
<u>Dissolved Metals</u>	<u>500 mL Plastic</u>	<u>HNO<sub>3</sub> - field filtered</u>
<u>Cyanide (Total + Amenable)</u>	<u>500 mL Plastic</u>	<u>NaOH</u>
<u>pH, SpCond, Fluoride</u>	<u>250 mL Plastic</u>	<u>4°C</u>
<u>PCE</u>	<u>2x40 mL Glass</u>	<u>HCl</u>

Sampling Personnel: J Campbell, C Standard  
 Comments: Color does not filter out

Project Name: Ormet  
 Project Number: Hm003.07  
 Site Location: Hannibal Ohio  
 Sampling Date: 5-8-97 Weather: Overcast 50's

Sample ID: MW-2  
 Replicate ID: \_\_\_\_\_  
 Time Sampling Began: 1133  
 Time Sampling Completed: 1215

**EVACUATION DATA**

Description of Measuring Point (MP) Top of PVC  
 MP Elevation \_\_\_\_\_ Diameter of Well Casing 2"  
 Total Sounded Depth of Well Below MP (TD) 85.23 Gallons to be Purged (13.1) 13.5  
 Depth to Water Below MP (DTW) 57.99 (3 WCVs, 5 WCVs, etc.)  
 Water Column (WC) in Well [TD-DTW] 27.24  
 Gallons per foot (GPF); from chart 0.16  
 Gallons in Well [WC x GPF] 4.36 = Well Casing Volume (WCV)

GALLONS PER FOOT (gpf)				
1" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65	
1 1/2" = 0.09	2 1/2" = 0.26	3 1/2" = 0.50	6" = 1.47	

Evacuation Method and Material Disposable bailer with poly rope

**SAMPLING DATA AND  
FIELD PARAMETERS**

Color: Dark brown-black Odor: Sl. wispy sheen Turbidity: Very Stained (no silt)  
 Temperature: (°C) 16 16 16 16 16 16  
 pH: (5.0) 10.10 10.09 10.03 10.07  
 Specific Conductance: ( $\mu\text{mhos/cm}$ ) 1845 1852 1870 1865

Sampling Method and Material(s): Disposable bailer with poly Rope

Parameters to be Analyzed	Container Description From Lab <input checked="" type="checkbox"/> or HMI _____	Preservative preserved by: Lab <input checked="" type="checkbox"/> or HMI _____
<u>Dissolved Metals</u>	<u>500 mL Plastic</u>	<u>HNO<sub>3</sub> - field filtered</u>
<u>Cyanide (Total + Amenable)</u>	<u>500 mL Plastic</u>	<u>NaOH</u>
<u>pH, SpCond, Fluoride</u>	<u>250 mL Plastic</u>	<u>4°C</u>
<u>PCE</u>	<u>2x40 mL Glass</u>	<u>HCl</u>

Sampling Personnel: J Campbell, C Standard  
 Comments: Color does not filter out

Project Name: Ormet  
 Project Number: Hm003.07  
 Site Location: Hannibal Ohio  
 Sampling Date: 5-8-97 Weather: Overcast 50°

Sample ID: MW-7  
 Replicate ID: MW-DUP-2  
 Time Sampling Began: 1308  
 Time Sampling Completed: 1340

## EVACUATION DATA

Description of Measuring Point (MP) Top of PVC  
 MP Elevation \_\_\_\_\_ Diameter of Well Casing 2"  
 Total Sounded Depth of Well Below MP (TD) 79.70 Gallons to be Purged (9.4) 10  
 Depth to Water Below MP (DTW) 60.18 (3 WCVs, 5 WCVs, etc.)  
 Water Column (WC) in Well (TD-DTW) 19.52  
 Gallons per foot (GPF); from chart 0.16  
 Gallons in Well [WC x GPF] 3.12 = Well Casing Volume (WCV)

GALLONS PER FOOT (gpf)			
1 1/4" = 0.08	2" = 0.16	3" = 0.37	4" = 0.65
1 1/2" = 0.09	2 1/2" = 0.26	3 1/2" = 0.50	6" = 1.47

Evacuation Method and Material Disposable bailer with poly rope

## SAMPLING DATA AND FIELD PARAMETERS

Color: Brown Odor: \_\_\_\_\_ Turbidity: Turbid and Silty  
 Temperature: (°C) 40 41 41 41 41  
 pH: (5.0) 5.93 5.92 5.99 6.04  
 Specific Conductance: ( $\mu$ mhos/cm) 711 691 678 670

Sampling Method and Material(s): Disposable bailer with poly Rope

Parameters to be Analyzed	Container Description From Lab <u>X</u> or HMI _____	Preservative preserved by: Lab <u>X</u> or HMI _____
<u>Dissolved Metals</u>	<u>500 mL Plastic</u>	<u>HNO<sub>3</sub> - field filtered</u>
<u>Cyanide (Total + Amenable)</u>	<u>500 mL Plastic</u>	<u>NaOH</u>
<u>pH, SpCond, Fluoride</u>	<u>250 mL Plastic</u>	<u>4°C</u>

Sampling Personnel: J Campbell, C Standard

Comments: \_\_\_\_\_

Project Name: Ormet  
 Project Number: Hm003.07  
 Site Location: Hannibal Ohio  
 Sampling Date: 5-8-97 Weather: Rain 50°

Sample ID: MW-10  
 Replicate ID: \_\_\_\_\_  
 Time Sampling Began: 1353  
 Time Sampling Completed: 1445

**EVACUATION DATA**

Description of Measuring Point (MP) Top of PVC  
 MP Elevation \_\_\_\_\_ Diameter of Well Casing 2"  
 Total Sounded Depth of Well Below MP (TD) 100.72 Gallons to be Purged (14.1) 14.5  
 Depth to Water Below MP (DTW) 71.40 (3 WCVs, 5 WCVs, etc.)  
 Water Column (WC) in Well (TD-DTW) 29.32  
 Gallons per foot (GPF): from chart 0.16  
 Gallons in Well [WC x GPF] 4.7 = Well Casing Volume (WCV)

GALLONS PER FOOT (gpf)				
1 1/2" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65	
1 3/4" = 0.09	2 1/2" = 0.26	3 1/2" = 0.50	6" = 1.47	

Evacuation Method and Material Disposable bailer with poly rope

**SAMPLING DATA AND  
FIELD PARAMETERS**

Color: Brown Odor: \_\_\_\_\_ Turbidity: Cloudy  
 Temperature: (°C) 17.5 17.5 17.5 17.5  
 pH: (S.U.) 7.32 7.36 7.38 7.40  
 Specific Conductance: ( $\mu$ mhos/cm) 510 512 508 510

Sampling Method and Material(s): Disposable bailer with poly Rope

Parameters to be Analyzed	Container Description	Preservative
Dissolved Metals	From Lab <u>X</u> or HMI _____ <u>500 mL Plastic</u>	preserved by: Lab <u>X</u> or HMI _____ <u>HNO<sub>3</sub> - field filtered</u>
Cyanide (Total + Amenable)	<u>500 mL Plastic</u>	<u>NaOH</u>
pH, SpCond, Fluoride	<u>250 mL Plastic</u>	<u>4°C</u>

Sampling Personnel: J Campbell, C Standard

Comments: \_\_\_\_\_

Project Name: Ormet

 Sample ID: MW-8

 Project Number: Hm003.07

Replicate ID: \_\_\_\_\_

 Site Location: Hannibal Ohio

 Time Sampling Began: 1452

 Sampling Date: 5-8-97 Weather: Rain 50°

 Time Sampling Completed: 1545
**EVACUATION DATA**

 Description of Measuring Point (MP) Top of PVC

MP Elevation \_\_\_\_\_

 Diameter of Well Casing 2"

 Total Sounded Depth of Well Below MP (TD) 99.78

 Gallons to be Purged (13.6) 14

 Depth to Water Below MP (DTW) 71.56

(3 WCVs, 5 WCVs, etc.)

 Water Column (WC) in Well (TD-DTW) 28.22

 Gallons per foot (GPF); from chart 0.16

 Gallons in Well (WC x GPF) 4.51

= Well Casing Volume (WCV)

**GALLONS PER FOOT (gpf)**

1" = 0.08	2" = 0.16	3" = 0.37	4" = 0.65
1 1/2" = 0.09	2 1/2" = 0.26	3 1/2" = 0.50	6" = 1.47

 Evacuation Method and Material Disposable bailer with poly rope
**SAMPLING DATA AND  
FIELD PARAMETERS**

 Color: None Odor: \_\_\_\_\_ Turbidity: Clear

 Temperature: (°C) 16.5 16.5 16.5 16.5

 pH: (S.U.) 7.97 7.99 7.98 8.02

 Specific Conductance: (µmhos/cm) 447 443 444 442

 Sampling Method and Material(s): Disposable bailer with poly Rope
**Parameters to be Analyzed**
**Container Description**
**Preservative**

 From Lab X or HMI \_\_\_\_\_

 preserved by: Lab X or HMI \_\_\_\_\_

Dissolved Metals
500 mL Plastic
HNO<sub>3</sub> - field filtered
Cyanide (Total + Amenable)
500 mL Plastic
NaOH
pH, SpCond, Fluoride
250 mL Plastic
4°C

 Sampling Personnel: J Campbell, C Standard

Comments: \_\_\_\_\_

Project Name: Ormet

Sample ID: MW-1

Project Number: Hm003.07

Replicate ID: \_\_\_\_\_

Site Location: Hannibal Ohio

Time Sampling Began: 0717

Sampling Date: 5-9-97 Weather: Lt Rain 50°

Time Sampling Completed: 0752

## EVACUATION DATA

Description of Measuring Point (MP) Top of PVC

MP Elevation \_\_\_\_\_

Diameter of Well Casing 2"

Total Sounded Depth of Well Below MP (TD) 71.11

Gallons to be Purged (7.8) 8

Depth to Water Below MP (DTW) 54.88

(3 WCVs, 5 WCVs, etc.)

Water Column (WC) in Well [TD-DTW] 16.23

Gallons per foot (GPF); from chart 0.16

Gallons in Well [WC x GPF] 2.6

= Well Casing Volume (WCV)

### GALLONS PER FOOT (gpf)

1 1/2" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
1 3/4" = 0.09	2 1/2" = 0.26	3 1/2" = 0.50	6" = 1.47

Evacuation Method and Material Disposable bailer with poly rope

## SAMPLING DATA AND FIELD PARAMETERS

Color: Brown Odor: \_\_\_\_\_ Turbidity: Turbid, Silty

Temperature: (°C) 17 17 17 17

pH: (5.0) 6.36 6.36 6.31 6.32

Specific Conductance: (µmhos/cm) 429 387 376 365

Sampling Method and Material(s): Disposable bailer with poly Rope

### Parameters to be Analyzed

### Container Description

### Preservative

From Lab X or HMI \_\_\_\_\_

preserved by: Lab X or HMI \_\_\_\_\_

Dissolved Metals
500 mL Plastic
HNO<sub>3</sub> - field filtered
Cyanide (Total + Amenable)
500 mL Plastic
NaOH
pH, SpCond, Fluoride
250 mL Plastic
4°C

Sampling Personnel:

J Campbell, C Standard

Comments:



Project Name: Ormet

 Sample ID: MW-11

 Project Number: Hm003.07

Replicate ID: \_\_\_\_\_

 Site Location: Hannibal Ohio

 Time Sampling Began: 0800

 Sampling Date: 5-9-97 Weather: Lt Rain 50°

 Time Sampling Completed: 0848
**EVACUATION DATA**

 Description of Measuring Point (MP) Top of PVC

MP Elevation \_\_\_\_\_

 Diameter of Well Casing 2"

 Total Sounded Depth of Well Below MP (TD) 97.35

 Gallons to be Purged (15.5) 15.5

 Depth to Water Below MP (DTW) 65.14

(3 WCVs, 5 WCVs, etc.)

 Water Column (WC) in Well (TD-DTW) 32.21

 Gallons per foot (GPF); from chart 0.16

 Gallons in Well [WC x GPF] 5.15

= Well Casing Volume (WCV)

**GALLONS PER FOOT (gpf)**

1" = 0.06 2" = 0.16 3" = 0.37 4" = 0.65

1 1/2" = 0.09 2 1/2" = 0.26 3 1/2" = 0.50 6" = 1.47

 Evacuation Method and Material Disposable bailer with poly rope
**SAMPLING DATA AND  
FIELD PARAMETERS**

 Color: None

Odor: \_\_\_\_\_

 Turbidity: Clear

Temperature: (°C)

17
17
17
17

 pH: (S.U.)
7.29
7.55
7.56
7.64

Specific Conductance: (µmhos/cm)

402
403
402
404

 Sampling Method and Material(s): Disposable bailer with poly Rope

Parameters to be Analyzed

Container Description

Preservative

 From Lab X or HMI \_\_\_\_\_

 preserved by: Lab X or HMI \_\_\_\_\_

Dissolved Metals
500 mL Plastic
HNO<sub>3</sub> - field filtered
Cyanide (Total + Amenable)
500 mL Plastic
NaOH
pH, SpCond, Fluoride
250 mL Plastic
4°C

Sampling Personnel:

J Campbell, C Standard

Comments: \_\_\_\_\_

Project Name: Ormet  
 Project Number: Hm003.07  
 Site Location: Hannibal Ohio  
 Sampling Date: 5-9-97 Weather: Overcast 50's

Sample ID: MW-28  
 Replicate ID: \_\_\_\_\_  
 Time Sampling Began: 0900  
 Time Sampling Completed: 0928

**EVACUATION DATA**

Description of Measuring Point (MP) Top of PVC  
 MP Elevation \_\_\_\_\_ Diameter of Well Casing 2"  
 Total Sounded Depth of Well Below MP (TD) 46.06 Gallons to be Purged (12.3) 12.5  
 Depth to Water Below MP (DTW) 20.56 (3 WCVs, 5 WCVs, etc.)  
 Water Column (WC) in Well (TD-DTW) 25.50  
 Gallons per foot (GPF); from chart 0.16  
 Gallons in Well [WC x GPF] 4.1 = Well Casing Volume (WCV)

GALLONS PER FOOT (gpf)				
1 1/4" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65	
1 1/2" = 0.09	2 1/2" = 0.25	3 1/2" = 0.50	6" = 1.47	

Evacuation Method and Material Disposable bailer with poly rope

**SAMPLING DATA AND  
FIELD PARAMETERS**

Color: Brown Odor: \_\_\_\_\_ Turbidity: Cloudy  
 Temperature: (°C) 15 15 15 15  
 pH: (S.U.) 7.01 6.60 6.52 6.40  
 Specific Conductance: ( $\mu$ mhos/cm) 460 457 458 453

Sampling Method and Material(s): Disposable bailer with poly rope

Parameters to be Analyzed	Container Description From Lab <input checked="" type="checkbox"/> or HMI _____	Preservative preserved by: Lab <input checked="" type="checkbox"/> or HMI _____
<u>Dissolved Metals</u>	<u>500 mL Plastic</u>	<u>HNO<sub>3</sub> - field filtered</u>
<u>Cyanide (Total + Amenable)</u>	<u>500 mL Plastic</u>	<u>NaOH</u>
<u>pH, SpCond, Fluoride</u>	<u>250 mL Plastic</u>	<u>4°C</u>

Sampling Personnel: J Campbell, C Standard

Comments: \_\_\_\_\_

Project Name: Ormet  
 Project Number: Hm003.07  
 Site Location: Hannibal Ohio  
 Sampling Date: 5-9-97 Weather: Overcast 50° Rain

Sample ID: MW-16  
 Replicate ID: \_\_\_\_\_  
 Time Sampling Began: 0937  
 Time Sampling Completed: 1018

## EVACUATION DATA

Description of Measuring Point (MP) Top of PVC  
 MP Elevation \_\_\_\_\_ Diameter of Well Casing 2"  
 Total Sounded Depth of Well Below MP (TD) 83.11 Gallons to be Purged (16.4) 16.5  
 Depth to Water Below MP (DTW) 48.99 (3 WCVs, 5 WCVs, etc.)  
 Water Column (WC) in Well (TD-DTW) 34.12  
 Gallons per foot (GPF); from chart 0.16  
 Gallons in Well [WC x GPF] 5.45 = Well Casing Volume (WCV)

GALLONS PER FOOT (gpf)				
1 1/4" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65	
1 1/2" = 0.09	2 1/2" = 0.26	3 1/2" = 0.50	6" = 1.47	

Evacuation Method and Material Disposable bailer with poly rope

## SAMPLING DATA AND FIELD PARAMETERS

Color: Brown Odor: \_\_\_\_\_ Turbidity: Stained (no silt)  
 Temperature: (°C) 15 15 15 15 <sup>final</sup>  
 pH: (5.0) 7.46 7.55 7.58 7.60  
 Specific Conductance: ( $\mu\text{mhos/cm}$ ) 811 800 797 801

Sampling Method and Material(s): Disposable bailer with poly Rope

Parameters to be Analyzed	Container Description	Preservative
Dissolved Metals	From Lab <u>X</u> or HMI _____ 500 mL Plastic	preserved by: Lab <u>X</u> or HMI _____ <u>HNO<sub>3</sub> - field filtered</u>
Cyanide (Total + Amenable)	500 mL Plastic	<u>NaOH</u>
pH, SpCond, Fluoride	250 mL Plastic	<u>4°C</u>

Sampling Personnel: J Campbell, C Standard  
 Comments: Color filters out

Project Name: Ormet  
 Project Number: Hm003.07  
 Site Location: Hannibal Ohio  
 Sampling Date: 5-9-97 Weather: Overcast 50°

Sample ID: MLW-295  
 Replicate ID: \_\_\_\_\_  
 Time Sampling Began: 1028  
 Time Sampling Completed: 1110

**EVACUATION DATA**

Description of Measuring Point (MP) Top of PVC  
 MP Elevation \_\_\_\_\_ Diameter of Well Casing 2"  
 Total Sounded Depth of Well Below MP (TD) 61.35 Gallons to be Purged (3.2) 13.5  
 Depth to Water Below MP (DTW) 40.10 (3 WCVs, 5 WCVs, etc.)  
 Water Column (WC) in Well (TD-DTW) 21.25  
 Gallons per foot (GPF); from chart 0.16  
 Gallons in Well [WC x GPF] 3.4 = Well Casing Volume (WCV)

GALLONS PER FOOT (gpf)			
1 1/4" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
1 1/2" = 0.09	2 1/2" = 0.26	3 1/2" = 0.50	6" = 1.47

Evacuation Method and Material Disposable bailer with poly rope

**SAMPLING DATA AND  
FIELD PARAMETERS**

Color: <u>Lt. Tan</u>	Odor: _____	Turbidity: <u>Very Sl. Cloudy</u>
Temperature: (°C) <u>16.5</u>	<u>16</u>	<u>16</u>
pH: <u>(S.U.)</u>	<u>8.33</u>	<u>8.41</u>
Specific Conductance: ( $\mu$ mhos/cm) <u>1700</u>	<u>1753</u>	<u>1735</u>

Sampling Method and Material(s): Disposable bailer with poly Rope

Parameters to be Analyzed	Container Description	Preservative
Dissolved Metals	From Lab <u>X</u> or HMI _____	preserved by: Lab <u>X</u> or HMI _____
<u>Dissolved Metals</u>	<u>500 mL Plastic</u>	<u>HNO<sub>3</sub> - field filtered</u>
<u>Cyanide (Total + Amenable)</u>	<u>500 mL Plastic</u>	<u>NaOH</u>
<u>pH, SpCond, Fluoride</u>	<u>250 mL Plastic</u>	<u>4°C</u>

Sampling Personnel: J Campbell, C Standard  
 Comments: Collected Field Blank C 1128 for above Parameters



**APPENDIX A-2**

**WATER SAMPLING LOG FORMS FOR MAY 1998 MONITORING EVENT**

# SAMPLING OF MONITORING WELLS DAILY CHECKLIST



PROJECT NO: HM003.08  
 LOCATION: Hannibal Ohio  
 SAMPLING PERSONNEL: J Campbell, J Menasky  
 COMPLETED BY: J Campbell

WELL(S): mw-15, 32, 35, 37, 41, 19  
 DATE: 5-4-98  
 TIME: \_\_\_\_\_

ITEMS	OK	NA	NOTES
<b>PRIOR TO SAMPLING</b>			
Health & safety plan; reviewed; equipment ready.	✓		
Sample containers, coolers, received from laboratory; ice or ice pack and coolers ready.	✓		
Sampling equipment and supplies inventoried, clean and operational.	✓		
On-site client contact notified.	✓		
Condition of well noted.	✓		
Well area prepared for sampling; plastic placed around well; gasoline-powered pumps placed downwind.	✓		
Water-level measurements made and recorded on Water Sampling Log with other pertinent field information.	✓		
Field instruments calibrated; calibration recorded in field logbook	✓		pH 4.0, 7.0, 10.0 SPC 700 $\mu$ mhos
Sample containers labelled; preservatives added, if necessary.	✓		
<b>DURING AND AFTER SAMPLING:</b>			
Three to five well volumes purged.	✓		At Least 3x with 10% Parameters Stabilized
Sample collected using a bailer or pump as per sampling plan.	✓		disposable bailer
Measurement of field parameters recorded on Water Sampling Log and in field log book.	✓		
Sample containers filled according to collection protocol of analyses.	✓		
Field and trip blanks collected; replicates or split samples collected and recorded in field log book.	✓		mw-32 dup is mw-32d
Samples stored on ice in coolers.	✓		
Water Sampling Log and Chain-of-Custody Recorded completed.	✓		
Reusable equipment decontaminated; non-reusable equipment disposed of in appropriate manner.	✓		
Well secured and locked.	✓		

Additional Comments: used 1 micron filters for dissolved metals

Original to Field Project File; copy to Project Manager and to QA Officer.

# SAMPLING OF MONITORING WELLS DAILY CHECKLIST



PROJECT NO: HMO03.08

LOCATION: Ormet

SAMPLING PERSONNEL: JC / SM

COMPLETED BY: JC

WELL(S): <sup>MW-39s, 39d</sup>  
MW-8, 10, 7, 11, 1, 28, 40d, 40s

DATE: 5-5-98

TIME: \_\_\_\_\_

ITEMS	OK	NA	NOTES
<b>PRIOR TO SAMPLING</b>			
Health & safety plan; reviewed; equipment ready.	✓		
Sample containers, coolers, received from laboratory; <del>ice</del> or ice pack and coolers ready.	✓		
Sampling equipment and supplies inventoried, clean and operational.	✓		
On-site client contact notified.	✓		
Condition of well noted.	✓		
Well area prepared for sampling; plastic placed around well; gasoline-powered pumps placed downwind.	✓		
Water-level measurements made and recorded on Water Sampling Log with other pertinent field information.	✓		
Field instruments calibrated; calibration recorded in field logbook	✓		pH 4, 7 + 10 SPC 700 + 3900
Sample containers labelled; preservatives added, if necessary.	✓		
<b>DURING AND AFTER SAMPLING:</b>			
Three to five well volumes purged.	✓		10% Stabilization
Sample collected using a bailer or pump as per sampling plan.	✓		
Measurement of field parameters recorded on Water Sampling Log and in field log book.	✓		
Sample containers filled according to collection protocol of analyses.	✓		
Field and trip blanks collected; replicates or split samples collected and recorded in field log book.	✓		mw-11 (mw-11d is dup)
Samples stored on ice in coolers.	✓		
Water Sampling Log and Chain-of-Custody Recorded completed.	✓		
Reusable equipment decontaminated; non-reusable equipment disposed of in appropriate manner.	✓		
Well secured and locked.	✓		

Additional Comments:

Original to Field Project File; copy to Project Manager and to QA Officer.



# SAMPLING OF MONITORING WELLS DAILY CHECKLIST



PROJECT NO: Hm003.08

LOCATION: Ormet

SAMPLING PERSONNEL: JL / sm

COMPLETED BY: JL

WELL(S): <sup>PCE Also</sup> mw-2, 5, 18, 30, 31, 12, 42, 42d, 16  
DATE: 5-6-98  
TIME: \_\_\_\_\_

ITEMS	OK	NA	NOTES
<b>PRIOR TO SAMPLING</b>			
Health & safety plan; reviewed; equipment ready.	✓		
Sample containers, coolers, received from laboratory; <u>ice</u> or ice pack and coolers ready.	✓		
Sampling equipment and supplies inventoried, clean and operational.	✓		
On-site client contact notified.	✓		
Condition of well noted.	✓		
Well area prepared for sampling; plastic placed around well; gasoline-powered pumps placed downwind.	✓		
Water-level measurements made and recorded on Water Sampling Log with other pertinent field information.	✓		
Field instruments calibrated; calibration recorded in field logbook	✓		pH 4, 7+10 ; SpC 700+3900
Sample containers labelled; preservatives added, if necessary.	✓		
<b>DURING AND AFTER SAMPLING:</b>			
Three to five well volumes purged.	✓		10% Stabilization
Sample collected using a bailer or pump as per sampling plan.	✓		
Measurement of field parameters recorded on Water Sampling Log and in field log book.	✓		
Sample containers filled according to collection protocol of analyses.	✓		
Field and trip blanks collected; replicates or split samples collected and recorded in field log book.	✓		Trip Blank (PCE only) mw-5 (mw-5d is dup) PCE Also
Samples stored on ice in coolers.	✓		
Water Sampling Log and Chain-of-Custody Recorded completed.	✓		
Reusable equipment decontaminated; non-reusable equipment disposed of in appropriate manner.	✓		
Well secured and locked.	✓		

Additional Comments:

Original to Field Project File; copy to Project Manager and to QA Officer.

# SAMPLING OF MONITORING WELLS DAILY CHECKLIST



PROJECT NO: Hm003.08  
LOCATION: Ormet  
SAMPLING PERSONNEL: JL/sm  
COMPLETED BY: JL

WELL(S): mw-34d, 17, 29s, 29d,  
DATE: 5-7-98  
TIME: \_\_\_\_\_

ITEMS	OK	NA	NOTES
<b>PRIOR TO SAMPLING</b>			
Health & safety plan; reviewed; equipment ready.	✓		
Sample containers, coolers, received from laboratory; <u>ice</u> or ice pack and coolers ready.	✓		
Sampling equipment and supplies inventoried, clean and operational.	✓		
On-site client contact notified.	✓		
Condition of well noted.	✓		
Well area prepared for sampling; plastic placed around well; gasoline-powered pumps placed downwind.	✓		
Water-level measurements made and recorded on Water Sampling Log with other pertinent field information.	✓		
Field instruments calibrated; calibration recorded in field logbook	✓		pH 4.7-10 ; SpC 700-3900
Sample containers labelled; preservatives added, if necessary.	✓		
<b>DURING AND AFTER SAMPLING:</b>			
Three to five well volumes purged.	✓		10% Stabilization
Sample collected using a bailer or pump as per sampling plan.	✓		
Measurement of field parameters recorded on Water Sampling Log and in field log book.	✓		
Sample containers filled according to collection protocol of analyses.	✓		
Field and trip blanks collected; replicates or split samples collected and recorded in field log book.	✓		Field Blank
Samples stored on ice in coolers.	✓		
Water Sampling Log and Chain-of-Custody Recorded completed.	✓		
Reusable equipment decontaminated; non-reusable equipment disposed of in appropriate manner.	✓		
Well secured and locked.	✓		

Additional Comments:

Original to Field Project File; copy to Project Manager and to QA Officer.

Project Name: Ormet  
 Project Number: HMD03.07  
 Site Location: Hannibal, Ohio  
 Sampling Date: 5/5/98 Weather: Rain 50's

Sample ID: MW-1  
 Replicate ID: \_\_\_\_\_  
 Time Sampling Began: 1005  
 Time Sampling Completed: 1025

## EVACUATION DATA

Description of Measuring Point (MP) Top of PVC  
 MP Elevation \_\_\_\_\_ Diameter of Well Casing 2"  
 Total Sounded Depth of Well Below MP (TD) 71.11 Gallons to be Purged 8  
 Depth to Water Below MP (DTW) 55.39 (3 WCVs, 5 WCVs, etc.)  
 Water Column (WC) in Well (TD-DTW) 15.72  
 Gallons per foot (GPF); from chart 0.16  
 Gallons in Well (WC x GPF) 2.52 = Well Casing Volume (WCV)

### GALLONS PER FOOT (gpf)

1" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
1 1/2" = 0.09	2 1/2" = 0.26	3 1/2" = 0.50	6" = 1.47

Evacuation Method and Material Disposable bailer with polypropylene rope

## SAMPLING DATA AND FIELD PARAMETERS

Color: Brown Odor: \_\_\_\_\_ Turbidity: Turbid

Well Volumes	1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	4 <sup>th</sup>	5 <sup>th</sup>	final
pH:	5.72	5.68	5.66			5.65
Specific Conductance:	520	500	495			505
Temperature:	15	15	15			15

Sampling Method and Material(s): Disposable bailer with polypropylene rope

Parameters to be Analyzed	Container Description	Preservative
Diss As, Be, Mn, Na, V	500 mL Plastic	HNO <sub>3</sub> - field filtered 1 micron
Cn - total, Cn - amenable	250 mL Plastic	NAOH
Spec Cond, pH, F	250 mL Plastic	4°C

Sampling Personnel: J Campbell, S Menosky

Comments: \_\_\_\_\_

Project Name: Ormet

Sample ID: MW-2

Project Number: Hm003.07

Replicate ID: \_\_\_\_\_

Site Location: Hannibal, Ohio

Time Sampling Began: 0705

Sampling Date: 5/6/98 Weather: Foggy 50's

Time Sampling Completed: 0740

## EVACUATION DATA

Description of Measuring Point (MP)

Top of PVC

MP Elevation

Diameter of Well Casing

2"

Total Sounded Depth of Well Below MP (TD)

85.23

Gallons to be Purged

13

Depth to Water Below MP (DTW)

58.99

(3 WCVs, 5 WCVs, etc.)

Water Column (WC) in Well [TD-DTW]

26.24

Gallons per foot (GPF); from chart

0.16

Gallons in Well [WC x GPF]

4.2

= Well Casing Volume (WCV)

### GALLONS PER FOOT (gpf)

1" = 0.06 2" = 0.16 3" = 0.37 4" = 0.65

1 1/2" = 0.09 2 1/2" = 0.26 3 1/2" = 0.50 6" = 1.47

Evacuation Method and Material

Disposable bailer with polypropylene rope

## SAMPLING DATA AND

## FIELD PARAMETERS

Color: DK brown-black

Odor: none - sheen

Turbidity: stained

Well Volumes	1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	4 <sup>th</sup>	5 <sup>th</sup>	final
pH:	10.17	10.21	10.22			10.24
Specific Conductance:	1870	1875	1870			1880
Temperature:	13.5	14	14			14

Sampling Method and Material(s):

Disposable bailer with polypropylene rope

Parameters to be Analyzed

Container Description

Preservative

From Lab X or HMI \_\_\_\_\_

preserved by: Lab X or HMI \_\_\_\_\_

Diss As, Be, Mn, Na, V
500 mL Plastic
HNO<sub>3</sub> - field filtered 1 micron
Cn-total, Cn-amenable
250 mL Plastic
NaOH
Spec Cond, pH, F
250 mL Plastic
4°C
PCE
2x40 mL Glass
HCL

Sampling Personnel:

J Campbell, S Menosky

Comments:

Color does not filter out

Project Name: Ormet

Sample ID: MW-5

Project Number: HMD03.07

Replicate ID: MW-5d

Site Location: Hannibal, Ohio

Time Sampling Began: 0750

Sampling Date: 5/16/98 Weather: foggy 50's

Time Sampling Completed: 0820

## EVACUATION DATA

Description of Measuring Point (MP) Top of PVC

MP Elevation \_\_\_\_\_ Diameter of Well Casing 2"

Total Sounded Depth of Well Below MP (TD) 91.88 Gallons to be Purged 12

Depth to Water Below MP (DTW) 67.25 (3 WCVs, 5 WCVs, etc.)

Water Column (WC) in Well (TD-DTW) 24.63

Gallons per foot (GPF); from chart 0.16

Gallons in Well (WC x GPF) 3.95 = Well Casing Volume (WCV)

### GALLONS PER FOOT (gpf)

1" = 0.06 2" = 0.16 3" = 0.37 4" = 0.65

1 1/2" = 0.09 2 1/2" = 0.26 3 1/2" = 0.50 5" = 1.47

Evacuation Method and Material Disposable bailer with polypropylene rope

## SAMPLING DATA AND

## FIELD PARAMETERS

Color: Lt Brown Odor: — Turbidity: Stained

Well Volumes	1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	4 <sup>th</sup>	5 <sup>th</sup>	final
pH:	8.75	8.84	8.84			8.84
Specific Conductance:	1340	1350	1340			1340
Temperature:	14.5	14.5	14.5			14.5

Sampling Method and Material(s): Disposable bailer with polypropylene rope

### Parameters to be Analyzed

### Container Description

### Preservative

From Lab X or HMI \_\_\_\_\_

preserved by: Lab X or HMI \_\_\_\_\_

Diss As, Be, Mn, Na, V
500 mL Plastic
HNO<sub>3</sub> - field filtered 1 micron
Cu - total, Cu - amenable
250 mL Plastic
NaOH
Spec Cond, pH, F
250 mL Plastic
4°C
PCE
2x40 mL Glass
HCL

Sampling Personnel:

J Campbell, S Menosky

Comments:

Color does not filter out

Project Name: Ormet  
 Project Number: HMD03.07  
 Site Location: Hannibal, Ohio  
 Sampling Date: 5/5/98 Weather: Rain 50's

Sample ID: MW-7  
 Replicate ID: \_\_\_\_\_  
 Time Sampling Began: 0920  
 Time Sampling Completed: 0940

**EVACUATION DATA**

Description of Measuring Point (MP) Top of PVC  
 MP Elevation \_\_\_\_\_ Diameter of Well Casing 2"  
 Total Sounded Depth of Well Below MP (TD) 79.70 Gallons to be Purged \_\_\_\_\_  
 Depth to Water Below MP (DTW) 61.05 (3 WCVs, 5 WCVs, etc.) \_\_\_\_\_  
 Water Column (WC) in Well [TD-DTW] 18.65  
 Gallons per foot (GPF); from chart 0.16  
 Gallons in Well [WC x GPF] 3 = Well Casing Volume (WCV)

GALLONS PER FOOT (gpf)				
1" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65	
1 1/2" = 0.09	2 1/2" = 0.26	3 1/2" = 0.50	6" = 1.47	

Evacuation Method and Material Disposable bailer with polypropylene rope

**SAMPLING DATA AND  
FIELD PARAMETERS**

Color: Brown Odor: \_\_\_\_\_ Turbidity: Turbid  

Well Volumes	1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	4 <sup>th</sup>	5 <sup>th</sup>	final
pH:	5.58	5.68	5.70			5.69
Specific Conductance:	920	905	900			900
Temperature:	41	41	41			41

Sampling Method and Material(s): Disposable bailer with polypropylene rope

Parameters to be Analyzed	Container Description	Preservative
Diss As, Be, Mn, Na, V	500 mL Plastic	HNO <sub>3</sub> - field filtered / micron
Cu - total, Cu - amenable	250 mL Plastic	NaOH
Spec Cond, pH, F	250 mL Plastic	4°C

Sampling Personnel: J Campbell, S Menosky

Comments: \_\_\_\_\_

Project Name: Ormet  
 Project Number: HMD03.07  
 Site Location: Hannibal, Ohio  
 Sampling Date: 5/5/98 Weather: Light Rain 60

Sample ID: MW-8  
 Replicate ID: \_\_\_\_\_  
 Time Sampling Began: 0725  
 Time Sampling Completed: 0750

## EVACUATION DATA

Description of Measuring Point (MP) Top of PVC  
 MP Elevation \_\_\_\_\_ Diameter of Well Casing 2"  
 Total Sounded Depth of Well Below MP (TD) 99.78 Gallons to be Purged 12.5  
 Depth to Water Below MP (DTW) 74.40 (3 WCVs, 5 WCVs, etc.)  
 Water Column (WC) in Well [TD-DTW] 25.38  
 Gallons per foot (GPF); from chart 0.16  
 Gallons in Well [WC x GPF] 4.1 = Well Casing Volume (WCV)

### GALLONS PER FOOT (gpf)

1" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
1 1/2" = 0.09	2 1/2" = 0.26	3 1/2" = 0.50	6" = 1.47

Evacuation Method and Material Disposable bailer with polypropylene rope

## SAMPLING DATA AND FIELD PARAMETERS

Color: None Odor: \_\_\_\_\_ Turbidity: Clear

Well Volumes	1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	4 <sup>th</sup>	5 <sup>th</sup>	final
pH:	7.28	7.49	7.55			7.60
Specific Conductance:	500	505	506			514
Temperature:	14.5	14.5	14.5			14.5

Sampling Method and Material(s): Disposable bailer with polypropylene rope

Parameters to be Analyzed	Container Description	Preservative
Diss As, Be, Mn, Na, V	500 mL Plastic	HNO <sub>3</sub> - field filtered 1 micron
Cn - total, Cn - amenable	250 mL Plastic	NAOH
Spec Cond, pH, F	250 mL Plastic	4°C

Sampling Personnel: J Campbell, S Menosky  
 Comments: \_\_\_\_\_

Project Name: Ormet  
 Project Number: HMD03.07  
 Site Location: Hannibal, Ohio  
 Sampling Date: 5/5/98 Weather: Light Rain 60°

Sample ID: MW-10  
 Replicate ID: \_\_\_\_\_  
 Time Sampling Began: 0755  
 Time Sampling Completed: 0828

## EVACUATION DATA

Description of Measuring Point (MP) Top of PVC  
 MP Elevation \_\_\_\_\_ Diameter of Well Casing 2"  
 Total Sounded Depth of Well Below MP (TD) 100.72 Gallons to be Purged 13  
 Depth to Water Below MP (DTW) 74.64 (3 WCVs, 5 WCVs, etc.)  
 Water Column (WC) in Well [TD-DTW] 26.08  
 Gallons per foot (GPF); from chart 0.16  
 Gallons in Well [WC x GPF] 4.2 = Well Casing Volume (WCV)

GALLONS PER FOOT (gpf)					
1" = 0.06	2" = 0.16	3" = 0.37	4" = 0.55		
1 1/2" = 0.09	2 1/2" = 0.26	3 1/2" = 0.50	6" = 1.47		

Evacuation Method and Material Disposable bailer with polypropylene rope

## SAMPLING DATA AND FIELD PARAMETERS

Color: Brown Odor: \_\_\_\_\_ Turbidity: V Cloudy - Turbid

Well Volumes	1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	4 <sup>th</sup>	5 <sup>th</sup>	final
pH:	<u>7.08</u>	<u>7.21</u>	<u>7.23</u>			<u>7.23</u>
Specific Conductance:	<u>1170</u>	<u>1100</u>	<u>1095</u>			<u>1110</u>
Temperature:	<u>22.5</u>	<u>22</u>	<u>22</u>			<u>22</u>

Sampling Method and Material(s): Disposable bailer with polypropylene rope

Parameters to be Analyzed	Container Description	Preservative
Diss As, Be, Mn, Na, V	500 mL Plastic	HNO <sub>3</sub> - field filtered 1 micron
Cn-total, Cn-amenable	250 mL Plastic	NAOH
Spec Cond, pH, F	250 mL Plastic	4°C

Sampling Personnel: J Campbell, S Menosky

Comments: \_\_\_\_\_  
 \_\_\_\_\_



Project Name: Ormet  
 Project Number: HMD03.07  
 Site Location: Hannibal, Ohio  
 Sampling Date: 5/5/98 Weather: Rain 50's

Sample ID: MW-11  
 Replicate ID: MW-11d  
 Time Sampling Began: 0840  
 Time Sampling Completed: 0912

## EVACUATION DATA

Description of Measuring Point (MP) Top of PVC  
 MP Elevation \_\_\_\_\_ Diameter of Well Casing 2"  
 Total Sounded Depth of Well Below MP (TD) 97.35 Gallons to be Purged 15  
 Depth to Water Below MP (DTW) 67.19 (3 WCVs, 5 WCVs, etc.)  
 Water Column (WC) in Well (TD-DTW) 30.16  
 Gallons per foot (GPF); from chart 0.16  
 Gallons in Well (WC x GPF) 4.83 = Well Casing Volume (WCV)

GALLONS PER FOOT (gpf)				
1" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65	
1" = 0.09	2" = 0.26	3" = 0.50	6" = 1.47	

Evacuation Method and Material Disposable bailer with polypropylene rope

## SAMPLING DATA AND FIELD PARAMETERS

Color: None Odor: — Turbidity: Clear

Well Volumes	1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	4 <sup>th</sup>	5 <sup>th</sup>	final
pH:	7.34	7.54	7.56			7.57
Specific Conductance:	500	506	506			507
Temperature:	14.5	14.5	14.5			14.5

Sampling Method and Material(s): Disposable bailer with polypropylene rope

Parameters to be Analyzed	Container Description	Preservative
Diss As, Be, Mn, Na, V	500 mL Plastic	HNO <sub>3</sub> - field filtered 1 micron
Cn-total, Cn-amenable	250 mL Plastic	NAOH
Spec Cond, pH, F	250 mL Plastic	4°C

Sampling Personnel: J Campbell, S Menosky  
 Comments: \_\_\_\_\_

Project Name: Ormet  
 Project Number: HMD03.07  
 Site Location: Hannibal, Ohio  
 Sampling Date: 5/6/98 Weather: Sunny 70°

Sample ID: MW-12  
 Replicate ID: \_\_\_\_\_  
 Time Sampling Began: 1255  
 Time Sampling Completed: 1322

## EVACUATION DATA

Description of Measuring Point (MP) Top of PVC  
 MP Elevation \_\_\_\_\_ Diameter of Well Casing 2"  
 Total Sounded Depth of Well Below MP (TD) 68.24 Gallons to be Purged 21.5  
 Depth to Water Below MP (DTW) 24.09 (3 WCVs, 5 WCVs, etc.)  
 Water Column (WC) in Well (TD-DTW) 44.15  
 Gallons per foot (GPF); from chart 0.16  
 Gallons in Well (WC x GPF) 7.1 = Well Casing Volume (WCV)

### GALLONS PER FOOT (gpf)

1 1/2" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
1 1/2" = 0.09	2 1/2" = 0.26	3 1/2" = 0.50	6" = 1.47

Evacuation Method and Material Disposable bailer with polypropylene rope

## SAMPLING DATA AND FIELD PARAMETERS

Color: None Odor: \_\_\_\_\_ Turbidity: Clear

Well Volumes	1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	4 <sup>th</sup>	5 <sup>th</sup>	final
pH:	7.30	7.40	7.40			7.43
Specific Conductance:	548	550	550			550
Temperature:	16°	16	16			16

Sampling Method and Material(s): Disposable bailer with polypropylene rope

Parameters to be Analyzed	Container Description	Preservative
Diss As, Be, Mn, Na, V	500 mL Plastic	HNO <sub>3</sub> - field filtered 1 micron
Cn - total, Cn - amenable	250 mL Plastic	NAOH
Spec Cond, pH, F	250 mL Plastic	4°C

Sampling Personnel: J Campbell, S Menosky

Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Project Name: Ormet  
 Project Number: HMD03.07  
 Site Location: Hannibal, Ohio  
 Sampling Date: 5/4/98 Weather: overcast 60°

Sample ID: MW-15  
 Replicate ID: \_\_\_\_\_  
 Time Sampling Began: 0950  
 Time Sampling Completed: 1015

## EVACUATION DATA

Description of Measuring Point (MP) Top of PVC  
 MP Elevation \_\_\_\_\_ Diameter of Well Casing 2"  
 Total Sounded Depth of Well Below MP (TD) 57.46 Gallons to be Purged 9.5  
 Depth to Water Below MP (DTW) 38.13 (3 WCVs, 5 WCVs, etc.)  
 Water Column (WC) in Well (TD-DTW) 19.73  
 Gallons per foot (GPF); from chart 0.16  
 Gallons in Well (WC x GPF) 3.16 = Well Casing Volume (WCV)

GALLONS PER FOOT (gpf)				
1 1/2" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65	
1 3/4" = 0.09	2 1/2" = 0.26	3 1/2" = 0.50	6" = 1.47	

Evacuation Method and Material Disposable bailer with polypropylene rope

## SAMPLING DATA AND FIELD PARAMETERS

Color: Brown Black Odor: \_\_\_\_\_ Turbidity: Stained + SI Cloudy

Well Volumes	1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	4 <sup>th</sup>	5 <sup>th</sup>	final
pH:	6.48	6.65	6.72			6.78
Specific Conductance:	626	615	630			625
Temperature:	14	14	14			14

Sampling Method and Material(s): Disposable bailer with polypropylene rope

Parameters to be Analyzed	Container Description	Preservative
Diss As, Be, Mn, Na, V	500 mL Plastic	HNO <sub>3</sub> - field filtered 1 micron
Cn - total, Cn - amenable	250 mL Plastic	NAOH
Spec Cond, pH, F	250 mL Plastic	4°C

Sampling Personnel: J Campbell, S Menosky

Comments: Color filters out; hard to filter

Project Name: Ormet  
 Project Number: Hm003.07  
 Site Location: Hannibal, Ohio  
 Sampling Date: 5/6/98 Weather: Sunny 70

Sample ID: MW-16  
 Replicate ID: \_\_\_\_\_  
 Time Sampling Began: 1455  
 Time Sampling Completed: 1630

## EVACUATION DATA

Description of Measuring Point (MP) Top of PVC  
 MP Elevation \_\_\_\_\_ Diameter of Well Casing 2"  
 Total Sounded Depth of Well Below MP (TD) 83.11 Gallons to be Purged \_\_\_\_\_  
 Depth to Water Below MP (DTW) 49.74 (3 WCVs, 5 WCVs, etc.) \_\_\_\_\_  
 Water Column (WC) in Well (TD-DTW) 33.37  
 Gallons per foot (GPF); from chart 0.16  
 Gallons in Well (WC x GPF) 5.33 = Well Casing Volume (WCV)

GALLONS PER FOOT (gpf)				
1" = 0.08	2" = 0.16	3" = 0.37	4" = 0.65	
1 1/2" = 0.09	2 1/2" = 0.26	3 1/2" = 0.50	6" = 1.47	

Evacuation Method and Material Disposable bailer with polypropylene rope

## SAMPLING DATA AND FIELD PARAMETERS

Color: Brown Odor: \_\_\_\_\_ Turbidity: Stained

Well Volumes	1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	4 <sup>th</sup>	5 <sup>th</sup>	final
pH:	<u>7.60</u>	<u>7.7</u>	<u>7.7</u>			<u>7.7</u>
Specific Conductance:	<u>775</u>	<u>770</u>	<u>765</u>			<u>760</u>
Temperature:	<u>14.5</u>	<u>14.5</u>	<u>14.5</u>			<u>14.5</u>

Sampling Method and Material(s): Disposable bailer with polypropylene rope

Parameters to be Analyzed	Container Description	Preservative
Diss As, Be, Mn, Na, V	500 mL Plastic	HNO <sub>3</sub> - field filtered 1 micron
Cn-total, Cn-amenable	250 mL Plastic	NAOH
Spec Cond, pH, F	250 mL Plastic	4°C

Sampling Personnel: J Campbell, S Menosky

Comments: \_\_\_\_\_

Project Name: Ormet  
 Project Number: Hm003.07  
 Site Location: Hannibal, Ohio  
 Sampling Date: 5/7/98 Weather: Cloudy 60's

Sample ID: MW-17  
 Replicate ID: \_\_\_\_\_  
 Time Sampling Began: 0825  
 Time Sampling Completed: 0855

**EVACUATION DATA**

Description of Measuring Point (MP) Top of PVC  
 MP Elevation \_\_\_\_\_ Diameter of Well Casing 2"  
 Total Sounded Depth of Well Below MP (TD) 77.91 Gallons to be Purged 19.5  
 Depth to Water Below MP (DTW) 37.99 (3 WCVs, 5 WCVs, etc.)  
 Water Column (WC) in Well [TD-DTW] 39.92  
 Gallons per foot (GPF); from chart 0.16  
 Gallons in Well [WC x GPF] 6.4 = Well Casing Volume (WCV)

**GALLONS PER FOOT (gpf)**

1 1/2" = 0.06 2" = 0.16 3" = 0.37 4" = 0.65  
 1 1/2" = 0.09 2 1/2" = 0.26 3 1/2" = 0.50 6" = 1.47

Evacuation Method and Material Disposable bailer with polypropylene rope

**SAMPLING DATA AND  
FIELD PARAMETERS**

Color: Brown Odor: \_\_\_\_\_ Turbidity: Turbid  

Well Volumes	1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	4 <sup>th</sup>	5 <sup>th</sup>	final
pH:	7.15	7.35	7.38			7.4
Specific Conductance:	570	590	580			580
Temperature:	14	13.5	13.5			13.5

Sampling Method and Material(s): Disposable bailer with polypropylene rope

Parameters to be Analyzed	Container Description	Preservative
Diss As, Be, Mn, Na, V	500 mL Plastic	HNO <sub>3</sub> - field filtered 1 micron
Cn - total, Cn - amenable	250 mL Plastic	NAOH
Spec Cond, pH, F	250 mL Plastic	4°C

Sampling Personnel: J Campbell, S Menosky

Comments: \_\_\_\_\_

Project Name: Ormet

 Sample ID: MW-18

 Project Number: Hm003.07

Replicate ID: \_\_\_\_\_

 Site Location: Hannibal, Ohio

 Time Sampling Began: 0930

 Sampling Date: 5/6/98 Weather: Sunny 60°

 Time Sampling Completed: 1007
**EVACUATION DATA**

 Description of Measuring Point (MP) Top of PVC

MP Elevation \_\_\_\_\_

 Diameter of Well Casing 2"

 Total Sounded Depth of Well Below MP (TD) 58.00

 Gallons to be Purged 9

 Depth to Water Below MP (DTW) 40.19

(3 WCVs, 5 WCVs, etc.)

 Water Column (WC) in Well (TD-DTW) 17.81

 Gallons per foot (GPF): from chart 0.16

 Gallons in Well (WC x GPF) 2.85

= Well Casing Volume (WCV)

**GALLONS PER FOOT (gpf)**

1" = 0.06 2" = 0.16 3" = 0.37 4" = 0.65

1 1/2" = 0.09 2 1/2" = 0.26 3 1/2" = 0.50 6" = 1.47

Evacuation Method and Material

Disposable bailer with polypropylene rope
**SAMPLING DATA AND**
**FIELD PARAMETERS**

Color: \_\_\_\_\_

 Odor: — Sheen

 Turbidity: DK brown-black Stained Turbid

Well Volumes	1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	4 <sup>th</sup>	5 <sup>th</sup>	final
pH:	10.0	10.0	10.02			10.06
Specific Conductance:	4150	4250	4220			4300
Temperature:	14.5	14.5	14.5			14.5

Sampling Method and Material(s):

Disposable bailer with polypropylene rope

Parameters to be Analyzed

Container Description

Preservative

 From Lab X or HMI \_\_\_\_\_

 preserved by: Lab X or HMI \_\_\_\_\_

Diss As, Be, Mn, Na, V
500 mL Plastic
HNO<sub>3</sub> - field filtered 1 micron
Cu - total, Cu - amenable
250 mL Plastic
NaOH
Spec Cond, pH, F
250 mL Plastic
4°C
PCE
2x40 mL Glass
HCL

Sampling Personnel:

J Campbell, S Menosky

Comments:

Color does not filter out, Hard to filter; well almost dry after 6 gal

Project Name: Ormet  
 Project Number: Hm003.07  
 Site Location: Hannibal, Ohio  
 Sampling Date: 5/4/98 Weather: Sunny 60's

Sample ID: MW-19  
 Replicate ID: \_\_\_\_\_  
 Time Sampling Began: 0915  
 Time Sampling Completed: 0940

## EVACUATION DATA

Description of Measuring Point (MP) Top of PVC  
 MP Elevation \_\_\_\_\_ Diameter of Well Casing 2"  
 Total Sounded Depth of Well Below MP (TD) 65.20 Gallons to be Purged 12  
 Depth to Water Below MP (DTW) 41.78 (3 WCVs, 5 WCVs, etc.)  
 Water Column (WC) in Well (TD-DTW) 23.42  
 Gallons per foot (GPF); from chart 0.16  
 Gallons in Well (WC x GPF) 3.75 = Well Casing Volume (WCV)

### GALLONS PER FOOT (gpf)

1" = 0.06 2" = 0.16 3" = 0.37 4" = 0.65  
 1 1/2" = 0.09 2 1/2" = 0.26 3 1/2" = 0.50 6" = 1.47

Evacuation Method and Material Disposable bailer with polypropylene rope

## SAMPLING DATA AND FIELD PARAMETERS

Color: Brown Odor: — Turbidity: Turbid  

Well Volumes	1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	4 <sup>th</sup>	5 <sup>th</sup>	final
pH:	6.56	6.81	6.90			6.95
Specific Conductance:	550	560	570			575
Temperature:	12	12	12			12

Sampling Method and Material(s): Disposable bailer with polypropylene rope

Parameters to be Analyzed	Container Description	Preservative
Diss As, Be, Mn, Na, V	500 mL Plastic	HNO <sub>3</sub> - field filtered 1 micron
Cn - total, Cn - amenable	250 mL Plastic	NAOH
Spec Cond, pH, F	250 mL Plastic	4°C

Sampling Personnel: J Campbell, S Menosky  
 Comments: \_\_\_\_\_

Project Name: Ormet  
 Project Number: HMD03.07  
 Site Location: Hannibal, Ohio  
 Sampling Date: 5/6/98 Weather: Rain 50's

Sample ID: MW-28  
 Replicate ID: \_\_\_\_\_  
 Time Sampling Began: 1037  
 Time Sampling Completed: 1055

## EVACUATION DATA

Description of Measuring Point (MP) Top of PVC  
 MP Elevation \_\_\_\_\_ Diameter of Well Casing 2"  
 Total Sounded Depth of Well Below MP (TD) 46.00 Gallons to be Purged 11.5  
 Depth to Water Below MP (DTW) 22.26 (3 WCVs, 5 WCVs, etc.)  
 Water Column (WC) in Well (TD-DTW) 23.80  
 Gallons per foot (GPF); from chart 0.16  
 Gallons in Well (WC x GPF) 3.81 = Well Casing Volume (WCV)

GALLONS PER FOOT (gpf)				
1" = 0.08	2" = 0.16	3" = 0.37	4" = 0.65	
1 1/2" = 0.09	2 1/2" = 0.26	3 1/2" = 0.50	6" = 1.47	

Evacuation Method and Material Disposable bailer with polypropylene rope

## SAMPLING DATA AND FIELD PARAMETERS

Color: Brown Odor: \_\_\_\_\_ Turbidity: Very cloudy  

Well Volumes	1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	4 <sup>th</sup>	5 <sup>th</sup>	final
pH:	5.25	5.30	5.30			5.32
Specific Conductance:	550	560	560			550
Temperature:	13.5	13.5	13.5			13.5

Sampling Method and Material(s): Disposable bailer with polypropylene rope

Parameters to be Analyzed	Container Description	Preservative
Diss As, Be, Mn, Na, V	500 mL Plastic	HNO <sub>3</sub> - field filtered 1 micron
Cn-total, Cn-amenable	250 mL Plastic	NAOH
Spec Cond, pH, F	250 mL Plastic	4°C

Sampling Personnel: J Campbell, S Menosky  
 Comments: \_\_\_\_\_



Project Name: Ormet  
 Project Number: HMD03.07  
 Site Location: Hannibal, Ohio  
 Sampling Date: 5/7/98 Weather: Lt Rain 60's

Sample ID: MW-295  
 Replicate ID: \_\_\_\_\_  
 Time Sampling Began: 0743  
 Time Sampling Completed: 0810

## EVACUATION DATA

Description of Measuring Point (MP) Top of PVC  
 MP Elevation \_\_\_\_\_ Diameter of Well Casing 2"  
 Total Sounded Depth of Well Below MP (TD) 61.35 Gallons to be Purged 10  
 Depth to Water Below MP (DTW) 40.86 (3 WCVs, 5 WCVs, etc.)  
 Water Column (WC) in Well [TD-DTW] 20.49  
 Gallons per foot (GPF); from chart 0.16  
 Gallons in Well [WC x GPF] 3.3 = Well Casing Volume (WCV)

### GALLONS PER FOOT (gpf)

1 1/4" = 0.08	2" = 0.16	3" = 0.37	4" = 0.65
1 1/2" = 0.09	2 1/2" = 0.26	3 1/2" = 0.50	6" = 1.47

Evacuation Method and Material Disposable bailer with polypropylene rope

## SAMPLING DATA AND FIELD PARAMETERS

Color: 1 Lt Tan Odor: \_\_\_\_\_ Turbidity: 1/2 Cloudy

Well Volumes	1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	4 <sup>th</sup>	5 <sup>th</sup>	final
pH:	8.7	8.7	8.7			8.7
Specific Conductance:	1625	1680	1675			1665
Temperature:	14.5	14.5	14.5			14.5

Sampling Method and Material(s): Disposable bailer with polypropylene rope

Parameters to be Analyzed	Container Description	Preservative
Diss As, Be, Mn, Na, V	500 mL Plastic	HNO <sub>3</sub> - field filtered 1 micron
Cn - total, Cn - amenable	250 mL Plastic	NAOH
Spec Cond, pH, F	250 mL Plastic	4°C

Sampling Personnel: J Campbell, S Menosky

Comments: \_\_\_\_\_

Project Name: Ormet  
 Project Number: HMD03.07  
 Site Location: Hannibal, Ohio  
 Sampling Date: 5/7/98 Weather: Lt Rain 60's

Sample ID: MW-29d  
 Replicate ID: \_\_\_\_\_  
 Time Sampling Began: 0710  
 Time Sampling Completed: 0740

## EVACUATION DATA

Description of Measuring Point (MP) Top of PVC  
 MP Elevation \_\_\_\_\_ Diameter of Well Casing 2"  
 Total Sounded Depth of Well Below MP (TD) 81.98 Gallons to be Purged 20  
 Depth to Water Below MP (DTW) 40.47 (3 WCVs, 5 WCVs, etc.)  
 Water Column (WC) in Well [TD-DTW] 41.51  
 Gallons per foot (GPF); from chart 0.16  
 Gallons in Well [WC x GPF] 6.65 = Well Casing Volume (WCV)

GALLONS PER FOOT (gpf)				
1" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65	
1 1/2" = 0.09	2 1/2" = 0.26	3 1/2" = 0.50	6" = 1.47	

Evacuation Method and Material Disposable bailer with polypropylene rope

## SAMPLING DATA AND FIELD PARAMETERS

Color: None Odor: \_\_\_\_\_ Turbidity: Clear

	1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	4 <sup>th</sup>	5 <sup>th</sup>	final
Well Volumes						
pH:	7.39	7.50	7.50			7.53
Specific Conductance:	565	565	560			560
Temperature:	14.5	14.5	14.5			14.5

Sampling Method and Material(s): Disposable bailer with polypropylene rope

Parameters to be Analyzed	Container Description	Preservative
Diss As, Be, Mn, Na, V	500 mL Plastic	HNO <sub>3</sub> - field filtered 1 micron
Cu - total, Cu - amenable	250 mL Plastic	NAOH
Spec Cond, pH, F	250 mL Plastic	4°C

Sampling Personnel: J Campbell, S Menosky  
 Comments: \_\_\_\_\_

Project Name: Ormet  
 Project Number: HMD03.07  
 Site Location: Hannibal, Ohio  
 Sampling Date: 5/6/98 Weather: foggy 50's

Sample ID: MW-30  
 Replicate ID: \_\_\_\_\_  
 Time Sampling Began: 0835  
 Time Sampling Completed: 0915

## EVACUATION DATA

Description of Measuring Point (MP) Top of PVC  
 MP Elevation \_\_\_\_\_ Diameter of Well Casing 2"  
 Total Sounded Depth of Well Below MP (TD) 60.41 Gallons to be Purged \_\_\_\_\_  
 Depth to Water Below MP (DTW) 49.52 (3 WCVs, 5 WCVs, etc.) \_\_\_\_\_  
 Water Column (WC) in Well [TD-DTW] 10.89  
 Gallons per foot (GPF); from chart 0.16  
 Gallons in Well [WC x GPF] 1.75 = Well Casing Volume (WCV)  
 Evacuation Method and Material Disposable bailer with polypropylene rope

GALLONS PER FOOT (gpf)				
1" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65	
1 1/2" = 0.09	2 1/2" = 0.26	3 1/2" = 0.50	5" = 1.47	

## SAMPLING DATA AND FIELD PARAMETERS

Color: Brown Odor: \_\_\_\_\_ Turbidity: Turbid v Cloudy

Well Volumes	1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	4 <sup>th</sup>	5 <sup>th</sup>	final
pH:	5.48	5.62	5.65			5.70
Specific Conductance:	400	410	416			418
Temperature:	14	14	14			14

Sampling Method and Material(s): Disposable bailer with polypropylene rope

Parameters to be Analyzed	Container Description	Preservative
Diss As, Be, Mn, Na, V	500 mL Plastic	HNO <sub>3</sub> - field filtered 1 micron
Cn - total, Cn - amenable	250 mL Plastic	NAOH
Spec Cond, pH, F	250 mL Plastic	4°C
PCE	2x40 mL Glass	HCL

Sampling Personnel: J Campbell, S Menosky  
 Comments: \_\_\_\_\_

Project Name: Ormet  
 Project Number: HMD03.07  
 Site Location: Hannibal, Ohio  
 Sampling Date: 5/6/98 Weather: Sunny 60's

Sample ID: MW-31  
 Replicate ID: \_\_\_\_\_  
 Time Sampling Began: 1020  
 Time Sampling Completed: 1046

## EVACUATION DATA

Description of Measuring Point (MP) Top of PVC  
 MP Elevation \_\_\_\_\_ Diameter of Well Casing 2"  
 Total Sounded Depth of Well Below MP (TD) 67.51 Gallons to be Purged 9.6  
 Depth to Water Below MP (DTW) 47.68 (3 WCVs, 5 WCVs, etc.)  
 Water Column (WC) in Well (TD-DTW) 19.83  
 Gallons per foot (GPF); from chart 0.16  
 Gallons in Well (WC x GPF) 3.17 = Well Casing Volume (WCV)

### GALLONS PER FOOT (gpf)

1 1/2" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
1 1/2" = 0.09	2 1/2" = 0.26	3 1/2" = 0.50	6" = 1.47

Evacuation Method and Material Disposable bailer with polypropylene rope

## SAMPLING DATA AND FIELD PARAMETERS

Color: Dark brown-black (cola) Odor: \_\_\_\_\_ Turbidity: Stained + Turbid

Well Volumes	1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	4 <sup>th</sup>	5 <sup>th</sup>	final
pH:	9.55	9.74	9.76			9.80
Specific Conductance:	2340	2340	2320			2350
Temperature:	15	14.5	14.5			14.5

Sampling Method and Material(s): Disposable bailer with polypropylene rope

Parameters to be Analyzed	Container Description	Preservative
Diss As, Be, Mn, Na, V	From Lab <u>X</u> or HMI _____	preserved by: Lab <u>X</u> or HMI _____
Cn-total, Cn-amenable	<u>500 mL Plastic</u>	<u>HNO<sub>3</sub>- field filtered 1 micron</u>
Spec Cond, pH, F	<u>250 mL Plastic</u>	<u>NaOH</u>
PCE	<u>250 mL Plastic</u>	<u>4°C</u>
	<u>2x40 mL Glass</u>	<u>HCL</u>

Sampling Personnel: J Campbell, S Menosky  
 Comments: Color does not filter out

Project Name: Ormet  
 Project Number: HMD03.07  
 Site Location: Hannibal, Ohio  
 Sampling Date: 5/4/98 Weather: Sunny 70's

Sample ID: MW-32  
 Replicate ID: MW-32d  
 Time Sampling Began: 1430  
 Time Sampling Completed: 1500

## EVACUATION DATA

Description of Measuring Point (MP) Top of PVC  
 MP Elevation \_\_\_\_\_ Diameter of Well Casing 2"  
 Total Sounded Depth of Well Below MP (TD) 57.18 Gallons to be Purged 8  
 Depth to Water Below MP (DTW) 40.68 (3 WCVs, 5 WCVs, etc.)  
 Water Column (WC) in Well (TD-DTW) 16.50  
 Gallons per foot (GPF); from chart 0.16  
 Gallons in Well (WC x GPF) 2.64 = Well Casing Volume (WCV)

GALLONS PER FOOT (gpf)				
1" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65	
1 1/2" = 0.09	2 1/2" = 0.26	3 1/2" = 0.50	6" = 1.47	

Evacuation Method and Material Disposable bailer with polypropylene rope

## SAMPLING DATA AND FIELD PARAMETERS

Color: Dark brown-black Odor: \_\_\_\_\_ Turbidity: Stained

Well Volumes	1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	4 <sup>th</sup>	5 <sup>th</sup>	final
pH:	8.00	8.10	8.10			8.10
Specific Conductance:	686	692	692			697
Temperature:	15	15	15			15

Sampling Method and Material(s): Disposable bailer with polypropylene rope

Parameters to be Analyzed	Container Description	Preservative
Diss As, Be, Mn, Na, V	500 mL Plastic	HNO <sub>3</sub> - field filtered 1 micron
Cn - total, Cn - amenable	250 mL Plastic	NAOH
Spec Cond, pH, F	250 mL Plastic	4°C

Sampling Personnel: J Campbell, S Menosky

Comments: Color filtered out, used 2<sup>nd</sup> filters with dup

Project Name: Ormet  
 Project Number: HM003.07  
 Site Location: Hannibal, Ohio  
 Sampling Date: 5/7/98 Weather: overcast 60's

Sample ID: MW-345  
 Replicate ID: \_\_\_\_\_  
 Time Sampling Began: 0930  
 Time Sampling Completed: \_\_\_\_\_

## EVACUATION DATA

Description of Measuring Point (MP) Top of PVC  
 MP Elevation \_\_\_\_\_ Diameter of Well Casing 2"  
 Total Sounded Depth of Well Below MP (TD) 49.35 Gallons to be Purged 6  
 Depth to Water Below MP (DTW) 37.12 (3 WCVs, 5 WCVs, etc.)  
 Water Column (WC) in Well (TD-DTW) 12.23  
 Gallons per foot (GPF); from chart 0.16  
 Gallons in Well [WC x GPF] 1.96 = Well Casing Volume (WCV)

GALLONS PER FOOT (gpf)				
1" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65	
1 1/2" = 0.09	2 1/2" = 0.25	3 1/2" = 0.50	5" = 1.47	

Evacuation Method and Material Disposable bailer with polypropylene rope

## SAMPLING DATA AND FIELD PARAMETERS

Color: \_\_\_\_\_ Odor: \_\_\_\_\_ Turbidity: \_\_\_\_\_  
 Well Volumes: 1<sup>st</sup> 2<sup>nd</sup> 3<sup>rd</sup> 4<sup>th</sup> 5<sup>th</sup> final  
 pH: \_\_\_\_\_  
 Specific Conductance: \_\_\_\_\_  
 Temperature: \_\_\_\_\_

Sampling Method and Material(s): Disposable bailer with polypropylene rope

### Parameters to be Analyzed

### Container Description

From Lab ☒ or HMI \_\_\_\_\_

### Preservative

preserved by: Lab ☒ or HMI \_\_\_\_\_

Diss. As, Be, Mn, Na, V  
Cu-total, Cu-amenable  
Spec Cond, pH, F

500 mL Plastic  
250 mL Plastic  
250 mL Plastic

HNO<sub>3</sub> - field filtered 1 micron  
NaOH  
4°C

Sampling Personnel: J. Campbell, S. Menosky

Comments: \_\_\_\_\_

Project Name: Ormet  
 Project Number: HMD03.07  
 Site Location: Hannibal, Ohio  
 Sampling Date: 5/7/98 Weather: Overcast 60's

Sample ID: MW-34d  
 Replicate ID: \_\_\_\_\_  
 Time Sampling Began: 0900  
 Time Sampling Completed: 0928

## EVACUATION DATA

Description of Measuring Point (MP) Top of PVC  
 MP Elevation \_\_\_\_\_ Diameter of Well Casing 2"  
 Total Sounded Depth of Well Below MP (TD) 68.24 Gallons to be Purged 15.5  
 Depth to Water Below MP (DTW) 36.07 (3 WCVs, 5 WCVs, etc.)  
 Water Column (WC) in Well [TD-DTW] 32.17  
 Gallons per foot (GPF); from chart 0.16  
 Gallons in Well [WC x GPF] 5.15 = Well Casing Volume (WCV)

GALLONS PER FOOT (gpf)				
1" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65	
1 1/2" = 0.09	2 1/2" = 0.26	3 1/2" = 0.50	6" = 1.47	

Evacuation Method and Material Disposable bailer with polypropylene rope

## SAMPLING DATA AND FIELD PARAMETERS

Color: Brown Odor: \_\_\_\_\_ Turbidity: V Cloudy

Well Volumes	1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	4 <sup>th</sup>	5 <sup>th</sup>	final
pH:	7.11	7.2	7.23			7.23
Specific Conductance:	600	590	600			595
Temperature:	13.5	13.5	13.5			13.5

Sampling Method and Material(s): Disposable bailer with polypropylene rope

Parameters to be Analyzed	Container Description	Preservative
Diss As, Be, Mn, Na, V	500 mL Plastic	HNO <sub>3</sub> - field filtered 1 micron
Cn - total, Cn - amenable	250 mL Plastic	NAOH
Spec Cond, pH, F	250 mL Plastic	4°C

Sampling Personnel: J Campbell, S Menosky  
 Comments: \_\_\_\_\_

Project Name: Ormet

Sample ID: MW-35

Project Number: HMD03.07

Replicate ID: \_\_\_\_\_

Site Location: Hannibal, Ohio

Time Sampling Began: 1515

Sampling Date: 5/4/98 Weather: Sunny 70's

Time Sampling Completed: 1545

## EVACUATION DATA

Description of Measuring Point (MP)

Top of PVC

MP Elevation

Diameter of Well Casing

2"

Total Sounded Depth of Well Below MP (TD)

46.70

Gallons to be Purged

5

Depth to Water Below MP (DTW)

36.62

(3 WCVs, 5 WCVs, etc.)

Water Column (WC) in Well [TD-DTW]

10.08

Gallons per foot (GPF); from chart

0.16

Gallons in Well [WC x GPF]

1.62

= Well Casing Volume (WCV)

### GALLONS PER FOOT (gpf)

1 1/2" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
1 3/4" = 0.09	2 1/2" = 0.26	3 1/2" = 0.50	6" = 1.47

Evacuation Method and Material

Disposable bailer with polypropylene rope

## SAMPLING DATA AND FIELD PARAMETERS

Color: lt Brown-black

Odor: \_\_\_\_\_

Turbidity: Stained

Well Volumes	1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	4 <sup>th</sup>	5 <sup>th</sup>	final
pH:	8.40	8.90	8.92			9.10
Specific Conductance:	575	645	650			766
Temperature:	15	15	15			15

Sampling Method and Material(s):

Disposable bailer with polypropylene rope

Parameters to be Analyzed

Container Description

Preservative

From Lab X or HMI \_\_\_\_\_

preserved by: Lab X or HMI \_\_\_\_\_

Diss As, Be, Mn, Na, V
500 mL Plastic
HNO<sub>3</sub> - field filtered 1 micron
Cn - total, Cn - amenable
250 mL Plastic
NAOH
Spec Cond, pH, F
250 mL Plastic
4°C

Sampling Personnel:

J Campbell, S Menosky

Comments:

After 30 gallons well almost dry; color does not filter out



Project Name: Ormet  
Project Number: HM003.07  
Site Location: Hannibal, Ohio  
Sampling Date: 5/1/98 Weather: \_\_\_\_\_

Sample ID: MW-36  
Replicate ID: \_\_\_\_\_  
Time Sampling Began: \_\_\_\_\_  
Time Sampling Completed: \_\_\_\_\_

EVACUATION DATA

Description of Measuring Point (MP) Top of PVC  
MP Elevation \_\_\_\_\_ Diameter of Well Casing 2"  
Total Sounded Depth of Well Below MP (TD) 52.08 Gallons to be Purged \_\_\_\_\_  
Depth to Water Below MP (DTW) \_\_\_\_\_ (3 WCVs, 5 WCVs, etc.)  
Water Column (WC) in Well [TD-DTW] \_\_\_\_\_  
Gallons per foot (GPF); from chart 0.16  
Gallons in Well [WC x GPF] \_\_\_\_\_ = Well Casing Volume (WCV)  
Evacuation Method and Material Disposable bailer with polypropylene rope

GALLONS PER FOOT (gpf)					
1" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65		
1 1/2" = 0.09	2 1/2" = 0.26	3 1/2" = 0.50	6" = 1.47		

SAMPLING DATA AND  
FIELD PARAMETERS

Color: \_\_\_\_\_ Odor: \_\_\_\_\_ Turbidity: \_\_\_\_\_  
Well Volumes: 

1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	4 <sup>th</sup>	5 <sup>th</sup>	final

  
pH: \_\_\_\_\_  
Specific Conductance: \_\_\_\_\_  
Temperature: \_\_\_\_\_

Sampling Method and Material(s): Disposable bailer with polypropylene rope

Parameters to be Analyzed	Container Description From Lab <u>X</u> or HMI _____	Preservative preserved by: Lab <u>X</u> or HMI _____
<u>Diss As, Be, Mn, Ni, V</u>	<u>500 mL Plastic</u>	<u>HNO<sub>3</sub> - field filtered 1 micron</u>
<u>Cu - total, Cu - amenable</u>	<u>250 mL Plastic</u>	<u>NAOH</u>
<u>Spec Cond, pH, F</u>	<u>250 mL Plastic</u>	<u>4°C</u>

Sampling Personnel: J Campbell, S Menosky  
Comments: \_\_\_\_\_

Project Name: Ormet  
 Project Number: HMD03.07  
 Site Location: Hannibal, Ohio  
 Sampling Date: 5/4/98 Weather: Sunny 70°

Sample ID: MW-37  
 Replicate ID: \_\_\_\_\_  
 Time Sampling Began: 1400  
 Time Sampling Completed: 1420

## EVACUATION DATA

Description of Measuring Point (MP) Top of PVC  
 MP Elevation \_\_\_\_\_ Diameter of Well Casing 2"  
 Total Sounded Depth of Well Below MP (TD) 36.98 Gallons to be Purged 8  
 Depth to Water Below MP (DTW) 20.87 (3 WCVs, 5 WCVs, etc.)  
 Water Column (WC) in Well [TD-DTW] 16.11  
 Gallons per foot (GPF); from chart 0.16  
 Gallons in Well [WC x GPF] 2.6 = Well Casing Volume (WCV)

GALLONS PER FOOT (gpf)				
1" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65	
1" = 0.09	2" = 0.26	3" = 0.50	6" = 1.47	

Evacuation Method and Material Disposable bailer with polypropylene rope

## SAMPLING DATA AND FIELD PARAMETERS

Color: Brown Odor: \_\_\_\_\_ Turbidity: Turbid + Stained

Well Volumes	1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	4 <sup>th</sup>	5 <sup>th</sup>	final
pH:	8.20	8.26	8.33			8.30
Specific Conductance:	507	510	510			505
Temperature:	14	14	14			14

Sampling Method and Material(s): Disposable bailer with polypropylene rope

Parameters to be Analyzed	Container Description	Preservative
Diss As, Be, Mn, Na, V	500 mL Plastic	HNO <sub>3</sub> - field filtered 1 micron
Cn - total, Cn - amenable	250 mL Plastic	NAOH
Spec Cond, pH, F	250 mL Plastic	4°C

Sampling Personnel: J Campbell, S Menosky

Comments: Color does not filter out, hard to filter

Project Name: Ormet  
 Project Number: HMD03.07  
 Site Location: Hannibal, Ohio  
 Sampling Date: 5/5/98 Weather: Overcast 60°

Sample ID: MW-39 s  
 Replicate ID: \_\_\_\_\_  
 Time Sampling Began: 1605  
 Time Sampling Completed: 1625

## EVACUATION DATA

Description of Measuring Point (MP) Top of PVC  
 MP Elevation \_\_\_\_\_ Diameter of Well Casing 2"  
 Total Sounded Depth of Well Below MP (TD) 60.23 Gallons to be Purged 9  
 Depth to Water Below MP (DTW) 41.68 (3 WCVs, 5 WCVs, etc.)  
 Water Column (WC) in Well (TD-DTW) 18.55  
 Gallons per foot (GPF); from chart 0.16  
 Gallons in Well [WC x GPF] 3 = Well Casing Volume (WCV)

GALLONS PER FOOT (gpf)				
1 1/2" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65	
1 3/4" = 0.09	2 1/2" = 0.26	3 1/2" = 0.50	6" = 1.47	

Evacuation Method and Material Disposable bailer with polypropylene rope

## SAMPLING DATA AND FIELD PARAMETERS

Color: <u>Lt Brown</u>	Odor: _____					Turbidity: <u>Stained</u>	
Well Volumes	1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	4 <sup>th</sup>	5 <sup>th</sup>	final	
pH:	9.02	9.09	9.09			9.09	
Specific Conductance:	4,100	4,060	4,050			4,000	
Temperature:	14.5	14.5	14.5			14.5	

Sampling Method and Material(s): Disposable bailer with polypropylene rope

Parameters to be Analyzed	Container Description	Preservative
Diss As, Be, Mn, Na, V	500 mL Plastic	HNO <sub>3</sub> - field filtered 1 micron
Cn - total, Cn - amenable	250 mL Plastic	NAOH
Spec Cond, pH, F	250 mL Plastic	4°C

Sampling Personnel: J Campbell, S Menosky  
 Comments: Color does not filter out

Project Name: Ormet  
 Project Number: HM003.07  
 Site Location: Hannibal, Ohio  
 Sampling Date: 5/5/98 Weather: Overcast 60

Sample ID: MW-39d  
 Replicate ID: \_\_\_\_\_  
 Time Sampling Began: 1525  
 Time Sampling Completed: 1600

## EVACUATION DATA

Description of Measuring Point (MP) Top of PVC  
 MP Elevation \_\_\_\_\_ Diameter of Well Casing 2"  
 Total Sounded Depth of Well Below MP (TD) 80.21 Gallons to be Purged 19  
 Depth to Water Below MP (DTW) 41.35 (3 WCVs, 5 WCVs, etc.)  
 Water Column (WC) in Well [TD-DTW] 38.86  
 Gallons per foot (GPF); from chart 0.16  
 Gallons in Well [WC x GPF] 6.22 = Well Casing Volume (WCV)

GALLONS PER FOOT (gpf)				
1" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65	
1" = 0.09	2" = 0.26	3" = 0.50	6" = 1.47	

Evacuation Method and Material Disposable bailer with polypropylene rope

## SAMPLING DATA AND FIELD PARAMETERS

Color: Lt Brown Odor: \_\_\_\_\_ Turbidity: SI Cloudy-Cloudy

	1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	4 <sup>th</sup>	5 <sup>th</sup>	final
Well Volumes						
pH:	7.20	7.30	7.35			7.35
Specific Conductance:	560	560	560			560
Temperature:	14	14	14			14

Sampling Method and Material(s): Disposable bailer with polypropylene rope

Parameters to be Analyzed	Container Description	Preservative
Diss As, Be, Mn, Na, V	500 mL Plastic	HNO <sub>3</sub> - field filtered 1 micron
Cu - total, Cu - amenable	250 mL Plastic	NAOH
Spec Cond, pH, F	250 mL Plastic	4°C

Sampling Personnel: J Campbell, S Menosky

Comments: \_\_\_\_\_

Project Name: Ormet  
 Project Number: HMD03.07  
 Site Location: Hannibal, Ohio  
 Sampling Date: 5/5/98 Weather: Light Rain 60°

Sample ID: MW-40s  
 Replicate ID: \_\_\_\_\_  
 Time Sampling Began: 1355  
 Time Sampling Completed: 1415

## EVACUATION DATA

Description of Measuring Point (MP) Top of PVC  
 MP Elevation \_\_\_\_\_ Diameter of Well Casing 2"  
 Total Sounded Depth of Well Below MP (TD) 70.40 Gallons to be Purged 9  
 Depth to Water Below MP (DTW) 52.93 (3 WCVs, 5 WCVs, etc.)  
 Water Column (WC) in Well [TD-DTW] 17.47  
 Gallons per foot (GPF); from chart 0.16  
 Gallons in Well [WC x GPF] 2.8 = Well Casing Volume (WCV)

GALLONS PER FOOT (gpf)					
1" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65		
1 1/2" = 0.09	2 1/2" = 0.26	3 1/2" = 0.50	6" = 1.47		

Evacuation Method and Material Disposable bailer with polypropylene rope

## SAMPLING DATA AND FIELD PARAMETERS

Color: 2± Brown Odor: \_\_\_\_\_ Turbidity: 6.51 Cloudy

Well Volumes	1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	4 <sup>th</sup>	5 <sup>th</sup>	final
pH:	8.14	8.16	8.17			8.18
Specific Conductance:	1288	1330	1330			1335
Temperature:	14.5	14.5	14.5			14.5

Sampling Method and Material(s): Disposable bailer with polypropylene rope

Parameters to be Analyzed	Container Description	Preservative
Diss As, Be, Mn, Na, V	500 mL Plastic	HNO <sub>3</sub> - field filtered 1 micron
Cn - total, Cn - amenable	250 mL Plastic	NAOH
Spec Cond, pH, F	250 mL Plastic	4°C

Sampling Personnel: J Campbell, S Menosky  
 Comments: \_\_\_\_\_

Project Name: Ormet  
 Project Number: HMD03.07  
 Site Location: Hannibal, Ohio  
 Sampling Date: 5/5/98

Sample ID: MW-40d  
 Replicate ID: \_\_\_\_\_  
 Time Sampling Began: 1318  
 Time Sampling Completed: 1350

Weather: Light Rain 55-60°

## EVACUATION DATA

Description of Measuring Point (MP) Top of PVC  
 MP Elevation \_\_\_\_\_ Diameter of Well Casing 2"  
 Total Sounded Depth of Well Below MP (TD) 90.40 Gallons to be Purged 18.5  
 Depth to Water Below MP (DTW) 52.75 (3 WCVs, 5 WCVs, etc.)  
 Water Column (WC) in Well [TD-DTW] 37.65  
 Gallons per foot (GPF); from chart 0.16  
 Gallons in Well [WC x GPF] 6.02 = Well Casing Volume (WCV)

GALLONS PER FOOT (gpf)				
1" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65	
1 1/2" = 0.09	2 1/2" = 0.26	3 1/2" = 0.50	6" = 1.47	

Evacuation Method and Material Disposable bailer with polypropylene rope

## SAMPLING DATA AND FIELD PARAMETERS

Color: None Odor: \_\_\_\_\_ Turbidity: Clear

Well Volumes	1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	4 <sup>th</sup>	5 <sup>th</sup>	final
pH:	7.50	7.68	7.70			7.73
Specific Conductance:	1250	1255	1255			1250
Temperature:	14.5	14.5	14.5			14.5

Sampling Method and Material(s): Disposable bailer with polypropylene rope

Parameters to be Analyzed	Container Description From Lab <u>X</u> or HMI _____	Preservative preserved by: Lab <u>X</u> or HMI _____
<u>Diss As, Be, Mn, Na, V</u>	<u>500 mL Plastic</u>	<u>HNO<sub>3</sub> - field filtered 1 micron</u>
<u>Cn-total, Cn-amenable</u>	<u>250 mL Plastic</u>	<u>NAOH</u>
<u>Spec Cond, pH, F</u>	<u>250 mL Plastic</u>	<u>4°C</u>

Sampling Personnel: J Campbell, S Menosky

Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Project Name: Ormet  
 Project Number: HM003.07  
 Site Location: Hannibal, Ohio  
 Sampling Date: 5/4/98 Weather: Sunny 70°

Sample ID: MW-41  
 Replicate ID: \_\_\_\_\_  
 Time Sampling Began: 1310  
 Time Sampling Completed: 1345

## EVACUATION DATA

Description of Measuring Point (MP) Top of PVC  
 MP Elevation \_\_\_\_\_ Diameter of Well Casing 2"  
 Total Sounded Depth of Well Below MP (TD) 62.26 Gallons to be Purged 24  
 Depth to Water Below MP (DTW) 12.99 (3 WCVs, 5 WCVs, etc.)  
 Water Column (WC) in Well [TD-DTW] 49.27  
 Gallons per foot (GPF); from chart 0.16  
 Gallons in Well [WC x GPF] 7.9 = Well Casing Volume (WCV)

GALLONS PER FOOT (gpf)				
1" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65	
1" = 0.09	2" = 0.25	3" = 0.50	6" = 1.47	

Evacuation Method and Material Disposable bailer with polypropylene rope

## SAMPLING DATA AND FIELD PARAMETERS

Color: Brown Odor: \_\_\_\_\_ Turbidity: Cloudy

Well Volumes	1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	4 <sup>th</sup>	5 <sup>th</sup>	final
pH:	6.53	6.70	6.70			6.74
Specific Conductance:	435	442	447			449
Temperature:	14	14	14			14

Sampling Method and Material(s): Disposable bailer with polypropylene rope

Parameters to be Analyzed	Container Description	Preservative
Diss As, Be, Mn, Na, V	500 mL Plastic	HNO <sub>3</sub> - field filtered 1 micron
Cn-total, Cn-amenable	250 mL Plastic	NAOH
Spec Cond, pH, F	250 mL Plastic	4°C

Sampling Personnel: J Campbell, S Menosky  
 Comments: \_\_\_\_\_

Project Name: Ormet  
 Project Number: HMD03.07  
 Site Location: Hannibal, Ohio  
 Sampling Date: 5/6/98 Weather: Sunny 70°

Sample ID: MW-425  
 Replicate ID: \_\_\_\_\_  
 Time Sampling Began: 1420  
 Time Sampling Completed: 1440

## EVACUATION DATA

Description of Measuring Point (MP) Top of PVC  
 MP Elevation \_\_\_\_\_ Diameter of Well Casing 2"  
 Total Sounded Depth of Well Below MP (TD) 52.30 Gallons to be Purged \_\_\_\_\_  
 Depth to Water Below MP (DTW) 40.74 (3 WCVs, 5 WCVs, etc.) \_\_\_\_\_  
 Water Column (WC) in Well [TD-DTW] 11.56  
 Gallons per foot (GPF); from chart 0.16  
 Gallons in Well [WC x GPF] 1.85 = Well Casing Volume (WCV)

GALLONS PER FOOT (gpf)				
1 1/2" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65	
1 3/4" = 0.09	2 1/2" = 0.26	3 1/2" = 0.50	6" = 1.47	

Evacuation Method and Material Disposable bailer with polypropylene rope

## SAMPLING DATA AND FIELD PARAMETERS

Color: Lt Brown Odor: \_\_\_\_\_ Turbidity: SI Cloudy

Well Volumes	1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	4 <sup>th</sup>	5 <sup>th</sup>	final
pH:	8.48	8.47	8.46			8.46
Specific Conductance:	1410	1445	1455			1460
Temperature:	15.5	15.5	15.5			15.5

Sampling Method and Material(s): Disposable bailer with polypropylene rope

Parameters to be Analyzed	Container Description From Lab <u>X</u> or HMI _____	Preservative preserved by: Lab <u>X</u> or HMI _____
<u>Diss As, Be, Mn, Na, V</u>	<u>500 mL Plastic</u>	<u>HNO<sub>3</sub> - field filtered 1 micron</u>
<u>Cn-total, Cn-amenable</u>	<u>250 mL Plastic</u>	<u>NAOH</u>
<u>Spec Cond, pH, F</u>	<u>250 mL Plastic</u>	<u>4°C</u>

Sampling Personnel: J Campbell, S Menosky

Comments: \_\_\_\_\_



Project Name: Ormet  
 Project Number: HMD03.07  
 Site Location: Hannibal, Ohio  
 Sampling Date: 5/6/98 Weather: Sunny 70

Sample ID: MW-42d  
 Replicate ID: \_\_\_\_\_  
 Time Sampling Began: 1332  
 Time Sampling Completed: 1415

## EVACUATION DATA

Description of Measuring Point (MP) Top of PVC  
 MP Elevation \_\_\_\_\_ Diameter of Well Casing 2"  
 Total Sounded Depth of Well Below MP (TD) 85.10 Gallons to be Purged \_\_\_\_\_  
 Depth to Water Below MP (DTW) 40.61 (3 WCVs, 5 WCVs, etc.) \_\_\_\_\_  
 Water Column (WC) in Well [TD-DTW] 44.49  
 Gallons per foot (GPF); from chart 0.16  
 Gallons in Well [WC x GPF] 7.12 = Well Casing Volume (WCV)

GALLONS PER FOOT (gpf)				
1" = 0.08	2" = 0.16	3" = 0.37	4" = 0.65	
1" = 0.09	2" = 0.26	3" = 0.50	6" = 1.47	

Evacuation Method and Material Disposable bailer with polypropylene rope

## SAMPLING DATA AND FIELD PARAMETERS

Color: None Odor: \_\_\_\_\_ Turbidity: Clear

Well Volumes	1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	4 <sup>th</sup>	5 <sup>th</sup>	final
pH:	7.6	7.62	7.64			7.64
Specific Conductance:	540	540	535			5.35
Temperature:	16.5	16	16			16

Sampling Method and Material(s): Disposable bailer with polypropylene rope

Parameters to be Analyzed	Container Description	Preservative
Diss As, Be, Mn, Na, V	500 mL Plastic	HNO <sub>3</sub> - field filtered 1 micron
Cn-total, Cn-amenable	250 mL Plastic	NAOH
Spec Cond, pH, F	250 mL Plastic	4°C

Sampling Personnel: J Campbell, S Menosky  
 Comments: \_\_\_\_\_



APPENDIX A-3

WATER SAMPLING LOG FORMS FOR AUGUST/SEPTEMBER  
1998 MONITORING EVENT

Project Name: Ormet

Sample ID: MW-2

Project Number: HMD03.08

Replicate ID: ~

Site Location: Hannibal, Ohio

Time Sampling Began: 8:10

Sampling Date: 9/1/98 Weather: SUNNY 65°

Time Sampling Completed: 8:45

## EVACUATION DATA

Description of Measuring Point (MP) Top of PVC

MP Elevation \_\_\_\_\_

Diameter of Well Casing 2"

Total Sounded Depth of Well Below MP (TD) 85.23

Gallons to be Purged 13.36

Depth to Water Below MP (DTW) 57.39

(3 WCVs, 5 WCVs, etc.)

Water Column (WC) in Well (TD-DTW) 27.84

Gallons per foot (GPF): from chart 0.16

Gallons in Well (WC x GPF) 4.45

= Well Casing Volume (WCV)

### GALLONS PER FOOT (gpf)

1 1/2" = 0.08	2" = 0.16	3" = 0.37	4" = 0.85
1 3/4" = 0.09	2 1/2" = 0.26	3 1/2" = 0.50	5" = 1.47

Evacuation Method and Material Disposable bailer with polypropylene rope

## SAMPLING DATA AND FIELD PARAMETERS

Color: BROWN/BLACK

Odor: None/SL Wisp Sheen

Turbidity: STAINED

Well Volumes	1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	4 <sup>th</sup>	5 <sup>th</sup>	final	
pH:	9.94	9.94	9.96	9.96			
Specific Conductance:	1882	1961	1994	1991			
Temperature:	14°	14°	14°	14°			

Sampling Method and Material(s): Disposable bailer with polypropylene rope

Parameters to be Analyzed

Container Description

Preservative

From Lab X or HMI \_\_\_\_\_

preserved by: Lab X or HMI \_\_\_\_\_

Diss As, Be, Mn, Na, V
500 mL Plastic
HNO<sub>3</sub> - field filtered 1 micron
Cn - total, Cn - amenable
250 mL Plastic
NaOH
Spec Cond, pH, F
250 mL Plastic
4°C
PCE
2x40 mL Glass
HCL

Sampling Personnel:

J Campbell, S Menosky

Comments:

Project Name: Ormet  
 Project Number: Hm003.08  
 Site Location: Hannibal, Ohio  
 Sampling Date: 9/1/98 Weather: Sunny 65°

Sample ID: MW-5  
 Replicate ID: ~  
 Time Sampling Began: 7:35  
 Time Sampling Completed: 8:05

## EVACUATION DATA

Description of Measuring Point (MP) Top of PVC  
 MP Elevation \_\_\_\_\_ Diameter of Well Casing 2"  
 Total Sounded Depth of Well Below MP (TD) 91.88 Gallons to be Purged 13.099  
 Depth to Water Below MP (DTW) 64.59 (3 WCVs, 5 WCVs, etc.)  
 Water Column (WC) in Well [TD-DTW] 27.29  
 Gallons per foot (GPF); from chart 0.16  
 Gallons in Well [WC x GPF] 4.3664 = Well Casing Volume (WCV)

GALLONS PER FOOT (gpf)				
1" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65	
1 1/2" = 0.09	2 1/2" = 0.26	3 1/2" = 0.50	6" = 1.47	

Evacuation Method and Material Disposable bailer with polypropylene rope

## SAMPLING DATA AND FIELD PARAMETERS

Color: TINT BROWN Odor: NONE Turbidity: CLEAR/TINT

Well Volumes	1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	4 <sup>th</sup>	5 <sup>th</sup>	final	
pH:	8.54	8.61	8.62	8.66			
Specific Conductance:	1222	1227	1226	1219			
Temperature:	14°	14°	14°	14°			

Sampling Method and Material(s): Disposable bailer with polypropylene rope

Parameters to be Analyzed	Container Description	Preservative
Diss As, Be, Mn, Na, V	500 mL Plastic	HNO <sub>3</sub> - field filtered 1 micron
Cn - total, Cn - amenable	250 mL Plastic	NAOH
Spec Cond, pH, F	250 mL Plastic	4°C
PCE	2x40 mL Glass	HCL

Sampling Personnel: J Campbell, S Menosky

Comments: \_\_\_\_\_

Project Name: Ormet  
 Project Number: Hm003.03  
 Site Location: Hannibal, Ohio  
 Sampling Date: 9/1/98 Weather: Sunny 80°

Sample ID: MW-12  
 Replicate ID: ~  
 Time Sampling Began: 1:25  
 Time Sampling Completed: 2:00

**EVACUATION DATA**

Description of Measuring Point (MP) Top of PVC  
 MP Elevation \_\_\_\_\_ Diameter of Well Casing 2"  
 Total Sounded Depth of Well Below MP (TD) 68.24 Gallons to be Purged 21.86  
 Depth to Water Below MP (DTW) 22.68 (3 WCVs, 5 WCVs, etc.)  
 Water Column (WC) in Well (TD-DTW) 45.56  
 Gallons per foot (GPF); from chart 0.16  
 Gallons in Well (WC x GPF) 7.2896 = Well Casing Volume (WCV)  
 Evacuation Method and Material Disposable bailer with polypropylene rope

GALLONS PER FOOT (gpf)				
1" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65	
1 1/2" = 0.09	2 1/2" = 0.26	3 1/2" = 0.50	6" = 1.47	

**SAMPLING DATA AND  
FIELD PARAMETERS**

Color: CLEAR Odor: NONE Turbidity: CLEAR

Well Volumes	1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	4 <sup>th</sup>	5 <sup>th</sup>	final
pH:	7.12	7.30	7.34	7.38		
Specific Conductance:	466	468	470	481		
Temperature:	15°	15°	15°	15		

Sampling Method and Material(s): Disposable bailer with polypropylene rope

Parameters to be Analyzed	Container Description	Preservative
Diss As, Be, Mn, Na, V	500 mL Plastic	HNO <sub>3</sub> - field filtered 1 micron
Cu - total, Cu - amenable	250 mL Plastic	NAOH
Spec Cond, pH, F	250 mL Plastic	4°C

Sampling Personnel: J Campbell, S Menosky

Comments: \_\_\_\_\_

Project Name: Ormet  
 Project Number: Hm003.03  
 Site Location: Hannibal, Ohio  
 Sampling Date: 9/1/98 Weather: SUNNY 70°

Sample ID: MW-16  
 Replicate ID: ~  
 Time Sampling Began: 10:00  
 Time Sampling Completed: 10:30

## EVACUATION DATA

Description of Measuring Point (MP) Top of PVC  
 MP Elevation \_\_\_\_\_ Diameter of Well Casing 2"  
 Total Sounded Depth of Well Below MP (TD) 83.11 Gallons to be Purged 16.65  
 Depth to Water Below MP (DTW) 48.42 (3 WCVs, 5 WCVs, etc.)  
 Water Column (WC) in Well (TD-DTW) 34.69  
 Gallons per foot (GPF); from chart 0.16  
 Gallons in Well (WC x GPF) 5.5504 = Well Casing Volume (WCV)

GALLONS PER FOOT (gpf)				
1 1/2" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65	
1 3/4" = 0.09	2 1/2" = 0.26	3 1/2" = 0.50	6" = 1.47	

Evacuation Method and Material Disposable bailer with polypropylene rope

## SAMPLING DATA AND FIELD PARAMETERS

Color: LT. BROWN Odor: NONE Turbidity: STAINED/CLOUDY

Well Volumes	1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	4 <sup>th</sup>	5 <sup>th</sup>	final
pH:	7.20	7.31	7.41	7.50		
Specific Conductance:	764	784	777	790		
Temperature:	14°	14°	14°	14°		

Sampling Method and Material(s): Disposable bailer with polypropylene rope

Parameters to be Analyzed	Container Description	Preservative
Diss As, Be, Mn, Na, V	500 mL Plastic	HNO <sub>3</sub> - field filtered 1 micron
Cu - total, Cu - amenable	250 mL Plastic	NAOH
Spec Cond, pH, F	250 mL Plastic	4°C

Sampling Personnel: J Campbell, S Menosky

Comments: \_\_\_\_\_

Project Name: Ormet

 Sample ID: MW-18

 Project Number: Hm003.08

 Replicate ID: ~

 Site Location: Hannibal, Ohio

 Time Sampling Began: 8:50

 Sampling Date: 9/1/98 Weather: Sunny 70°

 Time Sampling Completed: 9:20
**EVACUATION DATA**

 Description of Measuring Point (MP) Top of PVC

MP Elevation \_\_\_\_\_

 Diameter of Well Casing < 2"

 Total Sounded Depth of Well Below MP (TD) 57.00

 Gallons to be Purged 8.23

 Depth to Water Below MP (DTW) 39.85

(3 WCVs, 5 WCVs, etc.)

 Water Column (WC) in Well [TD-DTW] 17.15

 Gallons per foot (GPF); from chart 0.16

 Gallons in Well [WC x GPF] 2.744

= Well Casing Volume (WCV)

**GALLONS PER FOOT (gpf)**

1 1/2" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
1 3/4" = 0.09	2 1/2" = 0.26	3 1/2" = 0.50	6" = 1.47

 Evacuation Method and Material Disposable bailer with polypropylene rope
**SAMPLING DATA AND  
FIELD PARAMETERS**

 Color: Brown

 Odor: NONE / SL WISP SHEEN

 Turbidity: SILTY / CLOUDY

Well Volumes	1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	4 <sup>th</sup>	5 <sup>th</sup>	final
pH:	9.60	9.80	9.85	9.88		
Specific Conductance:	3460	3470	3550	3590		
Temperature:	13.5	13.5	14.0	14.0		

 Sampling Method and Material(s): Disposable bailer with polypropylene rope

Parameters to be Analyzed

Container Description

Preservative

 From Lab X or HMI \_\_\_\_\_

 preserved by: Lab X or HMI \_\_\_\_\_

Diss As, Be, Mn, Na, V
500 mL Plastic
HNO<sub>3</sub> - field filtered 1 micron
Cn-total, Cn-amenable
250 mL Plastic
NAOH
Spec Cond, pH, F
250 mL Plastic
4°C
PCE
2x40 mL Glass
HCL

Sampling Personnel:

J Campbell, S Menosky

Comments:



Project Name: Ormet  
 Project Number: Hm003.08  
 Site Location: Hannibal, Ohio  
 Sampling Date: 9/1/98 Weather: SUNNY 70°

Sample ID: mw-28  
 Replicate ID: mw-28d  
 Time Sampling Began: 9:20  
 Time Sampling Completed: 9:50

## EVACUATION DATA

Description of Measuring Point (MP) Top of PVC  
 MP Elevation \_\_\_\_\_ Diameter of Well Casing 2"  
 Total Sounded Depth of Well Below MP (TD) 46.06 Gallons to be Purged 12.0  
 Depth to Water Below MP (DTW) 21.06 (3 WCVs, 5 WCVs, etc.)  
 Water Column (WC) in Well (TD-DTW) 25.00  
 Gallons per foot (GPF); from chart 0.16  
 Gallons in Well (WC x GPF) 4.00 = Well Casing Volume (WCV)

GALLONS PER FOOT (gpf)				
1" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65	
1 1/2" = 0.09	2 1/2" = 0.26	3 1/2" = 0.50	6" = 1.47	

Evacuation Method and Material Disposable bailer with polypropylene rope

## SAMPLING DATA AND FIELD PARAMETERS

Color: TAN Odor: NONE Turbidity: CLOUDY

Well Volumes	1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	4 <sup>th</sup>	5 <sup>th</sup>	final
pH:	6.81	5.54	5.40	5.28		
Specific Conductance:	516	527	531	527		
Temperature:	15	15	15	15		

Sampling Method and Material(s): Disposable bailer with polypropylene rope

Parameters to be Analyzed	Container Description	Preservative
Diss As, Be, Mn, Na, V	From Lab <u>X</u> or HMI _____	preserved by: Lab <u>X</u> or HMI _____
Cu-total, Cu-amenable	<u>500 mL Plastic</u>	<u>HNO<sub>3</sub>- field filtered 1 micron</u>
Spec Cond, pH, F	<u>250 mL Plastic</u>	<u>NaOH</u>
	<u>250 mL Plastic</u>	<u>4°C</u>

Sampling Personnel: J Campbell, S Menosky

Comments: \_\_\_\_\_

Project Name: Ormet

Sample ID: mw-31

Project Number: Hm003.08

Replicate ID: mw-31d

Site Location: Hannibal, Ohio

Time Sampling Began: 10:40

Sampling Date: 9/1/98 Weather: Sunny 70°

Time Sampling Completed: 11:10

## EVACUATION DATA

Description of Measuring Point (MP) Top of PVC

MP Elevation \_\_\_\_\_

Diameter of Well Casing 2"

Total Sounded Depth of Well Below MP (TD) 67.51

Gallons to be Purged 10.13

Depth to Water Below MP (DTW) 46.40

(3 WCVs, 5 WCVs, etc.)

Water Column (WC) in Well (TD-DTW) 21.11

Gallons per foot (GPF); from chart 0.16

Gallons in Well (WC x GPF) 3.3776 = Well Casing Volume (WCV)

### GALLONS PER FOOT (gpf)

1" = 0.06 2" = 0.18 3" = 0.37 4" = 0.65

1 1/2" = 0.09 2 1/2" = 0.26 3 1/2" = 0.50 6" = 1.47

Evacuation Method and Material Disposable bailer with polypropylene rope

## SAMPLING DATA AND

## FIELD PARAMETERS

Color: Brown/BLACK

Odor: NONE

Turbidity: STAINED/CLOUDY

Well Volumes	1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	4 <sup>th</sup>	5 <sup>th</sup>	final
pH:	9.65	9.87	9.85	9.86		
Specific Conductance:	2020	2560	2500	2520		
Temperature:	15°	15°	15°	15°		

Sampling Method and Material(s): Disposable bailer with polypropylene rope

Parameters to be Analyzed

Container Description

Preservative

From Lab X or HMI \_\_\_\_\_

preserved by: Lab X or HMI \_\_\_\_\_

Diss As, Be, Mn, Na, V
500 mL Plastic
HNO<sub>3</sub> - field filtered 1 micron
Cn - total, Cn - amenable
250 mL Plastic
NaOH
Spec Cond, pH, F
250 mL Plastic
4°C
PCE
2x40 mL Glass
HCL

Sampling Personnel:

J Campbell, S Menosky

Comments:

Project Name: Ormet  
 Project Number: Hm003.03  
 Site Location: Hannibal, Ohio  
 Sampling Date: 9/1/98 Weather: Sunny 75°

Sample ID: MW-32  
 Replicate ID: ~  
 Time Sampling Began: 9-11:15  
 Time Sampling Completed: 11:40

## EVACUATION DATA

Description of Measuring Point (MP) Top of PVC  
 MP Elevation \_\_\_\_\_ Diameter of Well Casing 2"  
 Total Sounded Depth of Well Below MP (TD) 57.18 Gallons to be Purged 8.496  
 Depth to Water Below MP (DTW) 39.48 (3 WCVs, 5 WCVs, etc.)  
 Water Column (WC) in Well (TD-DTW) 17.70  
 Gallons per foot (GPF); from chart 0.16  
 Gallons in Well (WC x GPF) 2.832 = Well Casing Volume (WCV)

GALLONS PER FOOT (gpf)				
1 1/2" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65	
1 3/4" = 0.09	2 1/2" = 0.26	3 1/2" = 0.50	6" = 1.47	

Evacuation Method and Material Disposable bailer with polypropylene rope

## SAMPLING DATA AND FIELD PARAMETERS

Color: BROWN/BLACK Odor: NONE Turbidity: STAINED

Well Volumes	1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	4 <sup>th</sup>	5 <sup>th</sup>	final	
pH:	8.00	8.00	8.10	8.26			
Specific Conductance:	652	678	703	760			
Temperature:	15°	15°	15°	15°			

Sampling Method and Material(s): Disposable bailer with polypropylene rope

Parameters to be Analyzed	Container Description	Preservative
Diss As, Be, Mn, Na, V	500 mL Plastic	HNO <sub>3</sub> - field filtered 1 micron
Cu - total, Cu - amenable	250 mL Plastic	NaOH
Spec Cond, pH, F	250 mL Plastic	4°C

Sampling Personnel: J Campbell, S Menosky

Comments: \_\_\_\_\_

Project Name: Ormet  
 Project Number: Hm003.08  
 Site Location: Hannibal, Ohio  
 Sampling Date: 8/31/98 Weather: Sunny 75°

Sample ID: mw-35  
 Replicate ID: ~  
 Time Sampling Began: 6:15  
 Time Sampling Completed: 6:50

**EVACUATION DATA**

Description of Measuring Point (MP) Top of PVC  
 MP Elevation \_\_\_\_\_ Diameter of Well Casing 2"  
 Total Sounded Depth of Well Below MP (TD) 46.70 Gallons to be Purged 4.9872  
 Depth to Water Below MP (DTW) 36.31 (3 WCVs, 5 WCVs, etc.)  
 Water Column (WC) in Well [TD-DTW] 10.39  
 Gallons per foot (GPF); from chart 0.16  
 Gallons in Well [WC x GPF] 1.6624 = Well Casing Volume (WCV)

GALLONS PER FOOT (gpf)				
1" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65	
1 1/2" = 0.09	2 1/2" = 0.26	3 1/2" = 0.50	6" = 1.47	

Evacuation Method and Material Disposable bailer with polypropylene rope

**SAMPLING DATA AND  
FIELD PARAMETERS**

Color: Brown Odor: None Turbidity: STAINED

Well Volumes	1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	4 <sup>th</sup>	5 <sup>th</sup>	final	
pH:	6.51	7.00	8.27	8.58	8.90		
Specific Conductance:	361	400	592	630	778		
Temperature:	15	14.5	15	15	15		

Sampling Method and Material(s): Disposable bailer with polypropylene rope

Parameters to be Analyzed	Container Description	Preservative
Diss As, Be, Mn, Na, V	From Lab <u>X</u> or HMI _____	preserved by: Lab <u>X</u> or HMI _____
Cn-total, Cn-amenable	<u>500 mL Plastic</u>	<u>HNO<sub>3</sub> - field filtered 1 micron</u>
Spec Cond, pH, F	<u>250 mL Plastic</u>	<u>NAOH</u>
	<u>250 mL Plastic</u>	<u>4°C</u>

Sampling Personnel: J Campbell, S Menosky  
 Comments: Well went Dry after 3 gallons  
Color does not filter out

Project Name: Ormet  
 Project Number: HMC03.08  
 Site Location: Hannibal, Ohio  
 Sampling Date: 9/1/98 Weather: Sunny 75°

Sample ID: MW-36  
 Replicate ID: \_\_\_\_\_  
 Time Sampling Began: 2:10  
 Time Sampling Completed: 2:45

## EVACUATION DATA

Description of Measuring Point (MP) Top of PVC  
 MP Elevation \_\_\_\_\_ Diameter of Well Casing 2"  
 Total Sounded Depth of Well Below MP (TD) 54.50 Gallons to be Purged 8.0592  
 Depth to Water Below MP (DTW) 37.71 (3 WCVs, 5 WCVs, etc.)  
 Water Column (WC) in Well (TD-DTW) 16.79  
 Gallons per foot (GPF); from chart 0.16  
 Gallons in Well (WC x GPF) 2.6864 = Well Casing Volume (WCV)  
 Evacuation Method and Material Disposable bailer with polypropylene rope

## GALLONS PER FOOT (gpf)

1 1/2" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
1 3/4" = 0.09	2 1/2" = 0.26	3 1/2" = 0.50	6" = 1.47

## SAMPLING DATA AND FIELD PARAMETERS

Color: \_\_\_\_\_ Odor: \_\_\_\_\_ Turbidity: \_\_\_\_\_  

Well Volumes	1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	4 <sup>th</sup>	5 <sup>th</sup>	final
pH:	<u>10.18</u>	<u>10.15</u>	<u>10.10</u>	<u>10.08</u>	<u>10.10</u>	
Specific Conductance:	<u>4440</u>	<u>4460</u>	<u>4380</u>	<u>4370</u>	<u>4380</u>	
Temperature:	<u>15°</u>	<u>15°</u>	<u>15°</u>	<u>15°</u>	<u>15°</u>	

Sampling Method and Material(s): Disposable bailer with polypropylene rope

## Parameters to be Analyzed

## Container Description

## Preservative

From Lab X or HMI \_\_\_\_\_

preserved by: Lab X or HMI \_\_\_\_\_

Diss As, Be, Mn, Na, V  
Cn-total, Cn-amenable  
Spec Cond, pH, F

500 mL Plastic
250 mL Plastic
250 mL Plastic
HNO<sub>3</sub> - field filtered 1 micron
NAOH
4°C

Sampling Personnel:

J Campbell, S Menosky  
 Comments: Color did not filter out

Project Name: Ormet  
 Project Number: Hm003.03  
 Site Location: Hannibal, Ohio  
 Sampling Date: 8/31/98 Weather: Sunny 75°

Sample ID: mw-37  
 Replicate ID: ~  
 Time Sampling Began: 6:50  
 Time Sampling Completed: 7:15

**EVACUATION DATA**

Description of Measuring Point (MP) Top of PVC  
 MP Elevation \_\_\_\_\_ Diameter of Well Casing 2"  
 Total Sounded Depth of Well Below MP (TD) 36.98 Gallons to be Purged 8.48  
 Depth to Water Below MP (DTW) 19.31 (3 WCVs, 5 WCVs, etc.)  
 Water Column (WC) in Well [TD-DTW] 17.67  
 Gallons per foot (GPF); from chart 0.16  
 Gallons in Well [WC x GPF] 2.8272 = Well Casing Volume (WCV)

GALLONS PER FOOT (gpf)				
1 1/2" = 0.08	2" = 0.16	3" = 0.37	4" = 0.65	
1 3/4" = 0.09	2 1/2" = 0.26	3 1/2" = 0.50	6" = 1.47	

Evacuation Method and Material Disposable bailer with polypropylene rope

**SAMPLING DATA AND  
FIELD PARAMETERS**

Color: Brown Odor: NONE Turbidity: SILTY/CLOUDY

	1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	4 <sup>th</sup>	5 <sup>th</sup>	final
Well Volumes						
pH:	8.17	8.27	8.25	8.26		
Specific Conductance:	676	680	672	682		
Temperature:	15	15	15	15		

Sampling Method and Material(s): Disposable bailer with polypropylene rope

Parameters to be Analyzed	Container Description	Preservative
Diss As, Be, Mn, Na, V	500 mL Plastic	HNO <sub>3</sub> - field filtered 1 micron
Cu - total, Cu - amenable	250 mL Plastic	NAOH
Spec Cond, pH, F	250 mL Plastic	4°C

Sampling Personnel: J Campbell, S Menosky  
 Comments: Color does not filter out



## APPENDIX B

### LABORATORY ANALYTICAL REPORTS

- Appendix B-1 Laboratory Analytical Report for May 1997 Monitoring Event
- Appendix B-2 Laboratory Analytical Report for May 1998 Monitoring Event
- Appendix B-3 Laboratory Analytical Report for August/September 1998 Monitoring Event



APPENDIX B-1

LABORATORY ANALYTICAL REPORT FOR MAY 1997 MONITORING EVENT

**KEMRON Environmental Services**  
**109 Starlite Park**  
**Marietta, Ohio 45750**

Phone: (614) 373-4071



Ormet Corporation  
Hydrosystems Management Inc.  
331 S. Main Street, Suite 109  
Washington, PA 15301  
Attn: Bob Fargo

Login #: 97-05-082  
Date Received: 05/06/97  
Date Completed: 05/28/97  
Date Reported: 05/28/97 14:00  
Work ID: HM003.07/ORMET/HANNIBAL, OHIO

Client Code: ORMET-086

**SAMPLE IDENTIFICATION**

Sample Number	Sample Description	Sample Number	Sample Description
01	MW-15	02	MW-17
03	MW-32	04	MW-34S
05	MW-34D	06	MW-35
07	MW-36	08	MW-37
09	MW-41	10	MW-DUP-1

*All results for soils/sludges are reported on a dry weight basis, where applicable, unless otherwise specified. This report shall not be reproduced, except in full, without the prior written approval of KEMRON.*

A handwritten signature in black ink, reading "Deanna Hesson".

**Certified by**  
**Deanna Hesson**

**KEMRON ENVIRONMENTAL SERVICES**  
**RESULTS BY SAMPLE**

*This is to certify that the following samples were analyzed using good laboratory practices to show the following results.*

**SAMPLE ID: 01 MW-15 Collected: 05/06/97 Category: Water**

TEST DESCRIPTION	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED BY	METHOD
Cyanide, Amenable to Cl	0.20	0.10	mg/L	05/15/97 JWR	335.1
Cyanide, Total	2.8	0.10	mg/L	05/08/97 JWR	335.2\9010
Fluoride	11	1.0	mg/L	05/13/97 REB	340.2
pH (Laboratory)	7.4		S.U.	05/07/97 SCM	150.1
Specific Conductance	800	1	umho/cm	05/12/97 RJS	120.1
Arsenic, Dissolved	ND	0.004	mg/L	05/09/97 KHA	7060
Beryllium, Dissolved	ND	0.0005	mg/L	05/27/97 KHA	7091
Manganese, Dissolved	0.02	0.01	mg/L	05/14/97 JYH	6010A
Sodium, Dissolved	140	0.5	mg/L	05/14/97 JYH	6010A
Vanadium, Dissolved	ND	0.01	mg/L	05/14/97 JYH	6010A

**SAMPLE ID: 02 MW-17 Collected: 05/06/97 Category: Water**

TEST DESCRIPTION	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED BY	METHOD
Cyanide, Amenable to Cl	ND	0.010	mg/L	05/15/97 JWR	335.1
Cyanide, Total	0.54	0.050	mg/L	05/08/97 JWR	335.2\9010
Fluoride	3.1	0.10	mg/L	05/13/97 REB	340.2
pH (Laboratory)	7.5		S.U.	05/07/97 SCM	150.1
Specific Conductance	870	1	umho/cm	05/12/97 RJS	120.1
Arsenic, Dissolved	ND	0.004	mg/L	05/09/97 KHA	7060
Beryllium, Dissolved	ND	0.0005	mg/L	05/27/97 KHA	7091
Manganese, Dissolved	1.9	0.01	mg/L	05/14/97 JYH	6010A
Sodium, Dissolved	30	0.5	mg/L	05/14/97 JYH	6010A
Vanadium, Dissolved	ND	0.01	mg/L	05/14/97 JYH	6010A

**SAMPLE ID: 03 MW-32 Collected: 05/06/97 Category: Water**

TEST DESCRIPTION	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED BY	METHOD
Cyanide, Amenable to Cl	1.3	0.25	mg/L	05/15/97 JWR	335.1
Cyanide, Total	4.4	0.25	mg/L	05/08/97 JWR	335.2\9010
Fluoride	19	1.0	mg/L	05/13/97 REB	340.2
pH (Laboratory)	8.7		S.U.	05/07/97 SCM	150.1
Specific Conductance	930	1	umho/cm	05/12/97 RJS	120.1
Arsenic, Dissolved	0.008	0.004	mg/L	05/09/97 KHA	7060
Beryllium, Dissolved	ND	0.0005	mg/L	05/27/97 KHA	7091
Manganese, Dissolved	1.1	0.01	mg/L	05/14/97 JYH	6010A
Sodium, Dissolved	110	0.5	mg/L	05/14/97 JYH	6010A
Vanadium, Dissolved	ND	0.01	mg/L	05/14/97 JYH	6010A

**SAMPLE ID: 04 MW-34S Collected: 05/06/97 Category: Water**

TEST DESCRIPTION	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED BY	METHOD
Cyanide, Amenable to Cl	0.040	0.020	mg/L	05/15/97 JWR	335.1
Cyanide, Total	0.18	0.020	mg/L	05/08/97 JWR	335.2\9010
Fluoride	8.1	0.20	mg/L	05/13/97 REB	340.2

**NOTES AND DEFINITIONS:**

ND = Not detected at or above the reporting limit

**KEMRON ENVIRONMENTAL SERVICES**  
**RESULTS BY SAMPLE**

SAMPLE ID: 04 MW-34S Collected: 05/06/97 Category: Water

TEST DESCRIPTION	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED BY	METHOD
pH (Laboratory)	7.4		S.U.	05/07/97	SCM 150.1
Specific Conductance	710	1	umho/cm	05/12/97	RJS 120.1
Arsenic, Dissolved	ND	0.004	mg/L	05/09/97	KHA 7060
Beryllium, Dissolved	ND	0.0005	mg/L	05/27/97	KHA 7091
Manganese, Dissolved	0.04	0.01	mg/L	05/14/97	JYH 6010A
Sodium, Dissolved	69	0.5	mg/L	05/14/97	JYH 6010A
Vanadium, Dissolved	ND	0.01	mg/L	05/14/97	JYH 6010A

SAMPLE ID: 05 MW-34D Collected: 05/06/97 Category: Water

TEST DESCRIPTION	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED BY	METHOD
Cyanide, Amenable to Cl	ND	0.010	mg/L	05/15/97	JWR 335.1
Cyanide, Total	0.050	0.010	mg/L	05/08/97	JWR 335.2\9010
Fluoride	3.6	0.10	mg/L	05/13/97	REB 340.2
pH (Laboratory)	7.4		S.U.	05/07/97	SCM 150.1
Specific Conductance	630	1	umho/cm	05/12/97	RJS 120.1
Arsenic, Dissolved	ND	0.004	mg/L	05/09/97	KHA 7060
Beryllium, Dissolved	ND	0.0005	mg/L	05/27/97	KHA 7091
Manganese, Dissolved	0.79	0.01	mg/L	05/14/97	JYH 6010A
Sodium, Dissolved	31	0.5	mg/L	05/14/97	JYH 6010A
Vanadium, Dissolved	ND	0.01	mg/L	05/14/97	JYH 6010A

SAMPLE ID: 06 MW-35 Collected: 05/06/97 Category: Water

TEST DESCRIPTION	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED BY	METHOD
Cyanide, Amenable to Cl	ND	1.0	mg/L	05/15/97	JWR 335.1
Cyanide, Total	16	1.0	mg/L	05/08/97	JWR 335.2\9010
Fluoride	40	1.0	mg/L	05/13/97	REB 340.2
pH (Laboratory)	9.4		S.U.	05/07/97	SCM 150.1
Specific Conductance	1000	1	umho/cm	05/12/97	RJS 120.1
Arsenic, Dissolved	0.02	0.004	mg/L	05/09/97	KHA 7060
Beryllium, Dissolved	0.0006	0.0005	mg/L	05/27/97	KHA 7091
Manganese, Dissolved	0.68	0.01	mg/L	05/14/97	JYH 6010A
Sodium, Dissolved	220	0.5	mg/L	05/14/97	JYH 6010A
Vanadium, Dissolved	0.02	0.01	mg/L	05/14/97	JYH 6010A

SAMPLE ID: 07 MW-36 Collected: 05/06/97 Category: Water

TEST DESCRIPTION	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED BY	METHOD
Cyanide, Amenable to Cl	3.5	0.50	mg/L	05/15/97	JWR 335.1
Cyanide, Total	9.2	0.50	mg/L	05/08/97	JWR 335.2\9010
Fluoride	180	5.0	mg/L	05/13/97	REB 340.2
pH (Laboratory)	9.8		S.U.	05/07/97	SCM 150.1
Specific Conductance	3600	1	umho/cm	05/12/97	RJS 120.1
Arsenic, Dissolved	0.084	0.008	mg/L	05/09/97	KHA 7060
Beryllium, Dissolved	0.0035	0.0005	mg/L	05/27/97	KHA 7091
Manganese, Dissolved	1.7	0.01	mg/L	05/14/97	JYH 6010A
Sodium, Dissolved	850	0.5	mg/L	05/14/97	JYH 6010A

**NOTES AND DEFINITIONS:**

ND = Not detected at or above the reporting limit

**KEMRON ENVIRONMENTAL SERVICES**  
**RESULTS BY SAMPLE**

SAMPLE ID: 07 MW-36 Collected: 05/06/97 Category: Water

TEST DESCRIPTION	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED BY	METHOD
Vanadium, Dissolved	0.1	0.01	mg/L	05/14/97 JYH	6010A

SAMPLE ID: 08 MW-37 Collected: 05/06/97 Category: Water

TEST DESCRIPTION	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED BY	METHOD
Cyanide, Amenable to Cl	1.7	0.50	mg/L	05/15/97 JWR	335.1
Cyanide, Total	13	0.50	mg/L	05/08/97 JWR	335.2\9010
Fluoride	53	1.0	mg/L	05/13/97 REB	340.2
pH (Laboratory)	9.2		S.U.	05/07/97 SCM	150.1
Specific Conductance	1100	1	umho/cm	05/12/97 RJS	120.1
Arsenic, Dissolved	0.027	0.004	mg/L	05/09/97 KHA	7060
Beryllium, Dissolved	ND	0.0005	mg/L	05/27/97 KHA	7091
Manganese, Dissolved	0.56	0.01	mg/L	05/14/97 JYH	6010A
Sodium, Dissolved	210	0.5	mg/L	05/14/97 JYH	6010A
Vanadium, Dissolved	0.02	0.01	mg/L	05/14/97 JYH	6010A

SAMPLE ID: 09 MW-41 Collected: 05/06/97 Category: Water

TEST DESCRIPTION	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED BY	METHOD
Cyanide, Total	ND	0.010	mg/L	05/08/97 JWR	335.2\9010
Fluoride	0.20	0.10	mg/L	05/13/97 REB	340.2
pH (Laboratory)	6.8		S.U.	05/07/97 SCM	150.1
Specific Conductance	4900	1	umho/cm	05/12/97 RJS	120.1
Arsenic, Dissolved	0.022	0.004	mg/L	05/09/97 KHA	7060
Beryllium, Dissolved	ND	0.0005	mg/L	05/27/97 KHA	7091
Manganese, Dissolved	1.6	0.01	mg/L	05/14/97 JYH	6010A
Sodium, Dissolved	21	0.5	mg/L	05/14/97 JYH	6010A
Vanadium, Dissolved	ND	0.01	mg/L	05/14/97 JYH	6010A

SAMPLE ID: 10 MW-DUP-1 Collected: 05/06/97 Category: Water

TEST DESCRIPTION	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED BY	METHOD
Cyanide, Amenable to Cl	0.40	0.10	mg/L	05/15/97 JWR	335.1
Cyanide, Total	3.3	0.10	mg/L	05/08/97 JWR	335.2\9010
Fluoride	8.9	0.10	mg/L	05/13/97 REB	340.2
pH (Laboratory)	7.4		S.U.	05/07/97 SCM	150.1
Specific Conductance	800	1	umho/cm	05/12/97 RJS	120.1
Arsenic, Dissolved	ND	0.004	mg/L	05/09/97 KHA	7060
Beryllium, Dissolved	ND	0.0005	mg/L	05/27/97 KHA	7091
Manganese, Dissolved	0.05	0.01	mg/L	05/14/97 JYH	6010A
Sodium, Dissolved	140	0.5	mg/L	05/14/97 JYH	6010A
Vanadium, Dissolved	ND	0.01	mg/L	05/14/97 JYH	6010A

**NOTES AND DEFINITIONS:**

ND = Not detected at or above the reporting limit



Environmental Consulting Services

# CHAIN - OF - CUSTODY RECORD

Page 1 of 1

Project Number	Project Name/Location	Container Description/ Number of Containers									
		350 mL Plastic	350 mL Plastic	500 mL Plastic	500 mL Plastic	500 mL Plastic	500 mL Plastic	500 mL Plastic	500 mL Plastic	500 mL Plastic	500 mL Plastic
HMO03.07	Ormet / Hannibal Ohio Laboratory										
Sampling Personnel											
J Campbell C Standard											
Sample ID	Date	Sample Code									TOTAL
MW-15	5-6-97	L									3
MW-17											3
MW-32											3
MW-34s											3
MW-34d											3
MW-35											3
MW-36											3
MW-37											3
MW-41											3
MW-DUP-1	5-6-97	L									3
Total Number of Containers:											30

Sample Code: L = Liquid; S = Solid; A = Air

Relinquished by:	Organization:	Date:	Time:	Seal Intact?
Received by:	Organization:	Date:	Time:	Yes No NA
Relinquished by:	Organization:	Date:	Time:	Yes No NA
Received by:	Organization:	Date:	Time:	Yes No NA

REMARKS: Sips need intact cooler dump: wet use Sips stored in locked cooler overnight

DELIVERY METHOD:	In Person	Common Carrier	Lab Courier	Other
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**KEMRON Environmental Services**  
**109 Starlite Park**  
**Marietta, Ohio 45750**

Phone: (614) 373-4071



Ormet Corporation  
Hydrosystems Management Inc.  
331 S. Main Street, Suite 109  
Washington, PA 15301  
Attn: Bob Fargo

Login #: 97-05-164  
Date Received: 05/09/97  
Date Completed: 05/28/97  
Date Reported: 05/28/97 14:45  
Work ID: HM003.07/ORMET

Client Code: ORMET-086

**SAMPLE IDENTIFICATION**

Sample Number	Sample Description	Sample Number	Sample Description
01	MW-1	02	MW-11
03	MW-16	04	MW-29S
05	MW-28	06	FIELD BLANK

*All results for soils/sludges are reported on a dry weight basis, where applicable, unless otherwise specified. This report shall not be reproduced, except in full, without the prior written approval of KEMRON.*

A handwritten signature in black ink, appearing to read "Deanna Hesson", written over a horizontal line.

**Certified by**  
**Deanna Hesson**

**KEMRON ENVIRONMENTAL SERVICES**  
**RESULTS BY SAMPLE**

*This is to certify that the following samples were analyzed using good laboratory practices to show the following results.*

**SAMPLE ID: 01 MW-1 Collected: 05/09/97 Category: Water**

TEST DESCRIPTION	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED BY	METHOD
Cyanide, Total	ND	0.010	mg/L	05/14/97	JWR 335.2\9010
Fluoride	0.10	0.10	mg/L	05/13/97	REB 340.2
pH (Laboratory)	5.9		S.U.	05/09/97	DJP 150.1
Specific Conductance	470	1	umho/cm	05/13/97	DJP 120.1
Arsenic, Dissolved	ND	0.004	mg/L	05/15/97	KHA 7060
Beryllium, Dissolved	ND	0.0005	mg/L	05/27/97	KHA 7091
Manganese, Dissolved	0.13	0.01	mg/L	05/21/97	JYH 6010A
Sodium, Dissolved	19	0.5	mg/L	05/21/97	JYH 6010A
Vanadium, Dissolved	ND	0.01	mg/L	05/21/97	JYH 6010A

**SAMPLE ID: 02 MW-11 Collected: 05/09/97 Category: Water**

TEST DESCRIPTION	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED BY	METHOD
Cyanide, Amenable to Cl	ND	0.010	mg/L	05/20/97	JWR 335.1
Cyanide, Total	0.090	0.010	mg/L	05/14/97	JWR 335.2\9010
Fluoride	1.8	0.10	mg/L	05/13/97	REB 340.2
pH (Laboratory)	7.8		S.U.	05/09/97	DJP 150.1
Specific Conductance	530	1	umho/cm	05/13/97	DJP 120.1
Arsenic, Dissolved	ND	0.004	mg/L	05/15/97	KHA 7060
Beryllium, Dissolved	ND	0.0005	mg/L	05/27/97	KHA 7091
Manganese, Dissolved	0.42	0.01	mg/L	05/21/97	JYH 6010A
Sodium, Dissolved	33	0.5	mg/L	05/21/97	JYH 6010A
Vanadium, Dissolved	ND	0.01	mg/L	05/21/97	JYH 6010A

**SAMPLE ID: 03 MW-16 Collected: 05/09/97 Category: Water**

TEST DESCRIPTION	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED BY	METHOD
Cyanide, Amenable to Cl	0.30	0.10	mg/L	05/20/97	JWR 335.1
Cyanide, Total	1.3	0.10	mg/L	05/15/97	JWR 335.2\9010
Fluoride	11	1.0	mg/L	05/13/97	REB 340.2
pH (Laboratory)	7.6		S.U.	05/09/97	DJP 150.1
Specific Conductance	980	1	umho/cm	05/16/97	REB 120.1
Arsenic, Dissolved	ND	0.004	mg/L	05/15/97	KHA 7060
Beryllium, Dissolved	ND	0.0005	mg/L	05/27/97	KHA 7091
Manganese, Dissolved	0.43	0.01	mg/L	05/21/97	JYH 6010A
Sodium, Dissolved	130	0.5	mg/L	05/21/97	JYH 6010A
Vanadium, Dissolved	ND	0.01	mg/L	05/21/97	JYH 6010A

**SAMPLE ID: 04 MW-29S Collected: 05/09/97 Category: Water**

TEST DESCRIPTION	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED BY	METHOD
Cyanide, Amenable to Cl	ND	0.10	mg/L	05/20/97	JWR 335.1
Cyanide, Total	0.60	0.10	mg/L	05/15/97	JWR 335.2\9010
Fluoride	44	1.0	mg/L	05/13/97	REB 340.2
pH (Laboratory)	8.3		S.U.	05/09/97	DJP 150.1

**NOTES AND DEFINITIONS:**

ND = Not detected at or above the reporting limit



**KEMRON ENVIRONMENTAL SERVICES**  
**RESULTS BY SAMPLE**

SAMPLE ID: 04 MW-29S Collected: 05/09/97 Category: Water

TEST DESCRIPTION	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED BY	METHOD
Specific Conductance	2200	1	umho/cm	05/16/97	REB 120.1
Arsenic, Dissolved	ND	0.004	mg/L	05/15/97	KHA 7060
Beryllium, Dissolved	ND	0.0005	mg/L	05/27/97	KHA 7091
Manganese, Dissolved	0.14	0.01	mg/L	05/21/97	JYH 6010A
Sodium, Dissolved	410	0.5	mg/L	05/21/97	JYH 6010A
Vanadium, Dissolved	ND	0.01	mg/L	05/21/97	JYH 6010A

SAMPLE ID: 05 MW-28 Collected: 05/09/97 Category: Water

TEST DESCRIPTION	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED BY	METHOD
Cyanide, Amenable to Cl	ND	0.020	mg/L	05/20/97	JWR 335.1
Cyanide, Total	0.11	0.020	mg/L	05/15/97	JWR 335.2\9010
Fluoride	0.20	0.10	mg/L	05/13/97	REB 340.2
pH (Laboratory)	5.6		S.U.	05/09/97	DJP 150.1
Specific Conductance	590	1	umho/cm	05/16/97	REB 120.1
Arsenic, Dissolved	ND	0.004	mg/L	05/15/97	KHA 7060
Beryllium, Dissolved	ND	0.0005	mg/L	05/27/97	KHA 7091
Manganese, Dissolved	0.01	0.01	mg/L	05/21/97	JYH 6010A
Sodium, Dissolved	62	0.5	mg/L	05/21/97	JYH 6010A
Vanadium, Dissolved	ND	0.01	mg/L	05/21/97	JYH 6010A

SAMPLE ID: 06 FIELD BLANK Collected: 05/09/97 Category: Water

TEST DESCRIPTION	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED BY	METHOD
Cyanide, Total	ND	0.010	mg/L	05/15/97	JWR 335.2\9010
Fluoride	ND	0.10	mg/L	05/13/97	REB 340.2
pH (Laboratory)	5.7		S.U.	05/09/97	DJP 150.1
Specific Conductance	1	1	umho/cm	05/16/97	REB 120.1
Arsenic, Dissolved	ND	0.004	mg/L	05/15/97	KHA 7060
Beryllium, Dissolved	ND	0.0005	mg/L	05/27/97	KHA 7091
Manganese, Dissolved	ND	0.01	mg/L	05/21/97	JYH 6010A
Sodium, Dissolved	ND	0.5	mg/L	05/21/97	JYH 6010A
Vanadium, Dissolved	ND	0.01	mg/L	05/21/97	JYH 6010A

**NOTES AND DEFINITIONS:**

ND = Not detected at or above the reporting limit



*Environmental Consulting Services*

# CHAIN-OF-CUSTODY RECORD

[illegible]

Relinquished by: <i>Michael Pader</i>	Organization: <i>HydroSolutions Management Inc</i>	Date: <i>5-9-97</i>	Time: <i>1240</i>	Seal Intact? (Yes) No NA
Received by: <i>Michael Pader</i>	Organization: <i>Reflexion</i>	Date: <i>5-9-97</i>	Time: <i>1240</i>	
Relinquished by: <i>Michael Pader</i>	Organization: <i>Kanum</i>	Date: <i>5-9-97</i>	Time: <i>1350</i>	Seal Intact? (Yes) No NA
Received by: <i>Michael Pader</i>	Organization: <i>Reflexion</i>	Date: <i>5/9/97</i>	Time: <i>1350</i>	

REMARKS: Cooler Temp 8.0 / Gas St's need intact <sup>3/4</sup>

DELIVERY METHOD:	In Person	Common Carrier	Lab Courier	Other
			Kenway	

**KEMRON Environmental Services**  
**109 Starlite Park**  
**Marietta, Ohio 45750**

Phone: (614) 373-4071



Ormet Corporation  
Hydrosystems Management Inc.  
331 S. Main Street, Suite 109  
Washington, PA 15301  
Attn: Bob Fargo

Login #: 97-05-120  
Date Received: 05/07/97  
Date Completed: 05/28/97  
Date Reported: 05/28/97 14:32  
Work ID: HM003.07/ORMET HANNIBAL

Client Code: ORMET-086

**SAMPLE IDENTIFICATION**

Sample Number	Sample Description	Sample Number	Sample Description
01	MW-39S	02	MW-39D
03	MW-12	04	MW-42S
05	MW-42D	06	MW-19
07	MW-40S	08	MW-40D
09	MW-29D		

*All results for soils/sludges are reported on a dry weight basis, where applicable,  
unless otherwise specified. This report shall not be reproduced, except in full,  
without the prior written approval of KEMRON.*

A handwritten signature in black ink, appearing to read "Deanna Hesson", written over a horizontal line.

**Certified by**  
**Deanna Hesson**

**KEMRON ENVIRONMENTAL SERVICES**  
**RESULTS BY SAMPLE**

*This is to certify that the following samples were analyzed using good laboratory practices to show the following results.*

**SAMPLE ID: 01 MW-39S Collected: 05/07/97 Category: Water**

TEST DESCRIPTION	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED BY	METHOD
Cyanide, Amenable to Cl	ND	0.20	mg/L	05/15/97	JWR 335.1
Cyanide, Total	3.6	0.20	mg/L	05/12/97	REB 335.2\9010
Fluoride	150	4.0	mg/L	05/13/97	REB 340.2
pH (Laboratory)	8.9		S.U.	05/08/97	DJP 150.1
Specific Conductance	5500	1	umho/cm	05/13/97	DJP 120.1
Arsenic, Dissolved	0.009	0.004	mg/L	05/15/97	ALC 7060
Beryllium, Dissolved	ND	0.0005	mg/L	05/27/97	KHA 7091
Manganese, Dissolved	0.15	0.01	mg/L	05/09/97	JYH 6010A
Sodium, Dissolved	1300	10	mg/L	05/13/97	JYH 6010A
Vanadium, Dissolved	ND	0.01	mg/L	05/09/97	JYH 6010A

**SAMPLE ID: 02 MW-39D Collected: 05/07/97 Category: Water**

TEST DESCRIPTION	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED BY	METHOD
Cyanide, Amenable to Cl	0.060	0.010	mg/L	05/15/97	JWR 335.1
Cyanide, Total	0.060	0.010	mg/L	05/12/97	REB 335.2\9010
Fluoride	3.8	0.10	mg/L	05/13/97	REB 340.2
pH (Laboratory)	7.5		S.U.	05/08/97	DJP 150.1
Specific Conductance	630	1	umho/cm	05/13/97	DJP 120.1
Arsenic, Dissolved	ND	0.004	mg/L	05/15/97	ALC 7060
Beryllium, Dissolved	ND	0.0005	mg/L	05/27/97	KHA 7091
Manganese, Dissolved	0.87	0.01	mg/L	05/09/97	JYH 6010A
Sodium, Dissolved	32	0.5	mg/L	05/09/97	JYH 6010A
Vanadium, Dissolved	ND	0.01	mg/L	05/09/97	JYH 6010A

**SAMPLE ID: 03 MW-12 Collected: 05/07/97 Category: Water**

TEST DESCRIPTION	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED BY	METHOD
Cyanide, Total	ND	0.010	mg/L	05/12/97	REB 335.2\9010
Fluoride	0.90	0.10	mg/L	05/13/97	REB 340.2
pH (Laboratory)	7.5		S.U.	05/08/97	DJP 150.1
Specific Conductance	540	1	umho/cm	05/13/97	DJP 120.1
Arsenic, Dissolved	ND	0.004	mg/L	05/15/97	ALC 7060
Beryllium, Dissolved	ND	0.0005	mg/L	05/27/97	KHA 7091
Manganese, Dissolved	1.7	0.01	mg/L	05/09/97	JYH 6010A
Sodium, Dissolved	19	0.5	mg/L	05/09/97	JYH 6010A
Vanadium, Dissolved	ND	0.01	mg/L	05/09/97	JYH 6010A

**SAMPLE ID: 04 MW-42S Collected: 05/07/97 Category: Water**

TEST DESCRIPTION	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED BY	METHOD
Cyanide, Amenable to Cl	ND	0.020	mg/L	05/15/97	JWR 335.1
Cyanide, Total	0.56	0.020	mg/L	05/12/97	REB 335.2\9010
Fluoride	29	1.0	mg/L	05/13/97	REB 340.2
pH (Laboratory)	8.2		S.U.	05/08/97	DJP 150.1

**NOTES AND DEFINITIONS:**

ND = Not detected at or above the reporting limit

**KEMRON ENVIRONMENTAL SERVICES**  
**RESULTS BY SAMPLE**

**SAMPLE ID: 04 MW-42S** Collected: **05/07/97** Category: **Water**

TEST DESCRIPTION	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED BY	METHOD
Specific Conductance	1700	1	umho/cm	05/13/97 DJP	120.1
Arsenic, Dissolved	ND	0.004	mg/L	05/15/97 ALC	7060
Beryllium, Dissolved	ND	0.0005	mg/L	05/27/97 KHA	7091
Manganese, Dissolved	0.33	0.01	mg/L	05/09/97 JYH	6010A
Sodium, Dissolved	300	0.5	mg/L	05/09/97 JYH	6010A
Vanadium, Dissolved	ND	0.01	mg/L	05/09/97 JYH	6010A

**SAMPLE ID: 05 MW-42D** Collected: **05/07/97** Category: **Water**

TEST DESCRIPTION	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED BY	METHOD
Cyanide, Amenable to Cl	ND	0.010	mg/L	05/20/97 JWR	335.1
Cyanide, Total	0.040	0.010	mg/L	05/14/97 JWR	335.2\9010
Fluoride	3.2	0.10	mg/L	05/13/97 REB	340.2
pH (Laboratory)	7.6		S.U.	05/08/97 DJP	150.1
Specific Conductance	580	1	umho/cm	05/13/97 DJP	120.1
Arsenic, Dissolved	ND	0.004	mg/L	05/15/97 ALC	7060
Beryllium, Dissolved	ND	0.0005	mg/L	05/27/97 KHA	7091
Manganese, Dissolved	1.3	0.01	mg/L	05/09/97 JYH	6010A
Sodium, Dissolved	27	0.5	mg/L	05/09/97 JYH	6010A
Vanadium, Dissolved	ND	0.01	mg/L	05/09/97 JYH	6010A

**SAMPLE ID: 06 MW-19** Collected: **05/07/97** Category: **Water**

TEST DESCRIPTION	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED BY	METHOD
Cyanide, Amenable to Cl	ND	0.010	mg/L	05/20/97 JWR	335.1
Cyanide, Total	ND	0.010	mg/L	05/14/97 JWR	335.2\9010
Fluoride	2.0	0.10	mg/L	05/13/97 REB	340.2
pH (Laboratory)	7.4		S.U.	05/08/97 DJP	150.1
Specific Conductance	520	1	umho/cm	05/13/97 DJP	120.1
Arsenic, Dissolved	ND	0.004	mg/L	05/15/97 ALC	7060
Beryllium, Dissolved	ND	0.0005	mg/L	05/27/97 KHA	7091
Manganese, Dissolved	ND	0.01	mg/L	05/09/97 JYH	6010A
Sodium, Dissolved	18	0.5	mg/L	05/09/97 JYH	6010A
Vanadium, Dissolved	ND	0.01	mg/L	05/09/97 JYH	6010A

**SAMPLE ID: 07 MW-40S** Collected: **05/07/97** Category: **Water**

TEST DESCRIPTION	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED BY	METHOD
Cyanide, Amenable to Cl	0.40	0.10	mg/L	05/20/97 JWR	335.1
Cyanide, Total	0.72	0.10	mg/L	05/14/97 JWR	335.2\9010
Fluoride	21	0.50	mg/L	05/13/97 REB	340.2
pH (Laboratory)	7.9		S.U.	05/08/97 DJP	150.1
Specific Conductance	1900	1	umho/cm	05/13/97 DJP	120.1
Arsenic, Dissolved	ND	0.004	mg/L	05/15/97 ALC	7060
Beryllium, Dissolved	ND	0.0005	mg/L	05/27/97 KHA	7091
Manganese, Dissolved	0.66	0.01	mg/L	05/13/97 JYH	6010A
Sodium, Dissolved	380	0.5	mg/L	05/13/97 JYH	6010A
Vanadium, Dissolved	ND	0.01	mg/L	05/13/97 JYH	6010A

**NOTES AND DEFINITIONS:**

ND = Not detected at or above the reporting limit

**KEMRON ENVIRONMENTAL SERVICES**  
**RESULTS BY SAMPLE**

SAMPLE ID: 08 MW-40D Collected: 05/07/97 Category: Water

TEST DESCRIPTION	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED BY	METHOD
Cyanide, Amenable to Cl	ND	0.10	mg/L	05/20/97	JWR 335.1
Cyanide, Total	0.59	0.10	mg/L	05/14/97	JWR 335.2\9010
Fluoride	7.6	0.10	mg/L	05/13/97	REB 340.2
pH (Laboratory)	7.6		S.U.	05/08/97	DJP 150.1
Specific Conductance	1800	1	umho/cm	05/13/97	DJP 120.1
Arsenic, Dissolved	ND	0.004	mg/L	05/15/97	ALC 7060
Beryllium, Dissolved	ND	0.0005	mg/L	05/27/97	KHA 7091
Manganese, Dissolved	1.3	0.01	mg/L	05/13/97	JYH 6010A
Sodium, Dissolved	340	0.5	mg/L	05/13/97	JYH 6010A
Vanadium, Dissolved	ND	0.01	mg/L	05/13/97	JYH 6010A

SAMPLE ID: 09 MW-29D Collected: 05/07/97 Category: Water

TEST DESCRIPTION	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED BY	METHOD
Cyanide, Amenable to Cl	ND	0.020	mg/L	05/20/97	JWR 335.1
Cyanide, Total	0.18	0.020	mg/L	05/14/97	JWR 335.2\9010
Fluoride	3.3	0.10	mg/L	05/13/97	REB 340.2
pH (Laboratory)	7.7		S.U.	05/08/97	DJP 150.1
Specific Conductance	600	1	umho/cm	05/13/97	DJP 120.1
Arsenic, Dissolved	ND	0.004	mg/L	05/15/97	ALC 7060
Beryllium, Dissolved	ND	0.0005	mg/L	05/27/97	KHA 7091
Manganese, Dissolved	2	0.01	mg/L	05/13/97	JYH 6010A
Sodium, Dissolved	31	0.5	mg/L	05/13/97	JYH 6010A
Vanadium, Dissolved	ND	0.01	mg/L	05/13/97	JYH 6010A

**NOTES AND DEFINITIONS:**

ND = Not detected at or above the reporting limit



Environmental Consulting Services

# CHAIN - OF - CUSTODY RECORD

Page 1 of 1

Project Number	Project Name/Location	Container Description/ Number of Containers					
Sample ID	Date/Time	Sample Code	350 mL Plastic (4°C)	500 mL Plastic (NADH)	500 mL Plastic (NADH) + Amenable	Dissolved Metals	MDS-field Filtered
HM00307	Ormet/Hamilton Ohio Laboratory						
Sampling Personnel: Kemron							
J Campbell / C Standard							
MW-39s	5-7-97	L					
MW-39d							
MW-12							
MW-42s							
MW-42d							
MW-19							
MW-40s							
MW-40d							
MW-29d							
Total Number of Containers:							27

Sample Code: L = Liquid; S = Solid; A = Air

Relinquished by:	Organization: Hydro-Systems Management Inc	Date: 5-7-97	Time: 1623	Seal Intact?
Received by:	Organization: J Campbell	Date: 5-7-97	Time: 1623	Yes No NA
Relinquished by:	Organization: Kemron	Date: 5-7-97	Time: 1730	Seal Intact?
Received by:	Organization: Kemron	Date: 5-8-97	Time: 800	Yes No NA

REMARKS: Cooler Temp: 11.0 / Spgs rec'd intact & stored in locked walk-in cooler night. (Ans)

DELIVERY METHOD:

In Person

Common Carrier

Lab Courier

Kemron

Other

**KEMRON Environmental Services**  
**109 Starlite Park**  
**Marietta, Ohio 45750**

Phone: (614) 373-4071

Ormet Corporation  
Hydrosystems Management Inc.  
331 S. Main Street, Suite 109  
Washington, PA 15301  
Attn: Bob Fargo

Login #: 97-06-121  
Date Received: 05/08/97  
Date Completed: 06/09/97  
Date Reported: 06/09/97 14:40  
Work ID: HM003.07/ORMET/PRV. 05-156

Client Code: ORMET-086

**SAMPLE IDENTIFICATION**

Sample Number	Sample Description	Sample Number	Sample Description
01	MW-DUP-3		

*All results for soils/sludges are reported on a dry weight basis, where applicable,  
unless otherwise specified. This report shall not be reproduced, except in full,  
without the prior written approval of KEMRON.*

Maren M Beery  
Certified by  
Maren M. Beery



Order # 97-06-121  
June 9, 1997 14:41

**KEMRON ENVIRONMENTAL SERVICES**  
**RESULTS BY SAMPLE**

Page 2

*This is to certify that the following samples were analyzed using good laboratory practices to show the following results.*

SAMPLE ID: **01 MW-DUP-3** Collected: **05/08/97** Category: **Water**

TEST DESCRIPTION	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED BY	METHOD
Cyanide, Amenable to Cl	3.5 (A)	0.010	mg/L	06/06/97 RJS	335.1

**NOTES AND DEFINITIONS:**

(A) = See the report narrative

Order #97-06-121  
June 9, 1997 14:41

**KEMRON ENVIRONMENTAL SERVICES**  
**REPORT NARRATIVE**

(CYANIDE) A = Due to lab error, the cyanide ammenable to chlorination was not previously run. The sample was analyzed out of the recommended hold time of fourteen (14) days.

**KEMRON Environmental Services**  
**109 Starlite Park**  
**Marietta, Ohio 45750**

Phone: (614) 373-4071



Ormet Corporation  
Hydrosystems Management Inc.  
331 S. Main Street, Suite 109  
Washington, PA 15301  
Attn: Bob Fargo

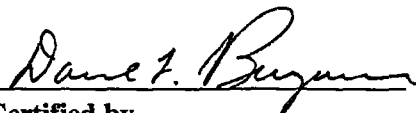
Login #: 97-05-156  
Date Received: 05/08/97  
Date Completed: 05/30/97  
Date Reported: 05/30/97 13:12  
Work ID: HM003.07/ORMET

Client Code: ORMET-086

**SAMPLE IDENTIFICATION**

Sample Number	Sample Description	Sample Number	Sample Description
01	TRIP BLANK #1	02	MW-31
03	MW-30	04	MW-18
05	MW-2	06	MW-5
07	MW-7	08	MW-8
09	MW-10	10	MW-DUP-2
11	MW-DUP-3		

*All results for soils/sludges are reported on a dry weight basis, where applicable, unless otherwise specified. This report shall not be reproduced, except in full, without the prior written approval of KEMRON.*

  
Certified by  
David L. Bumgarner

**KEMRON ENVIRONMENTAL SERVICES**  
**RESULTS BY SAMPLE**

*This is to certify that the following samples were analyzed using good laboratory practices to show the following results.*

**SAMPLE ID: 02 MW-31 Collected: 05/08/97 Category: Water**

TEST DESCRIPTION	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED BY	METHOD
Cyanide, Amenable to Cl	ND	0.50	mg/L	05/20/97 JWR	335.1
Cyanide, Total	12	0.50	mg/L	05/14/97 JWR	335.2
Fluoride	110	2.5	mg/L	05/13/97 REB	340.2
pH (Laboratory)	9.9		S.U.	05/09/97 DJP	150.1
Specific Conductance	2500	1	umho/cm	05/12/97 RJS	120.1
Arsenic, Dissolved	0.04	0.004	mg/L	05/15/97 KHA	7060
Beryllium, Dissolved	0.0007	0.0005	mg/L	05/27/97 KHA	7091
Manganese, Dissolved	0.68	0.01	mg/L	05/19/97 AJS	6010A
Sodium, Dissolved	480	5	mg/L	05/19/97 AJS	6010A
Vanadium, Dissolved	0.05	0.01	mg/L	05/19/97 AJS	6010A

**SAMPLE ID: 03 MW-30 Collected: 05/08/97 Category: Water**

TEST DESCRIPTION	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED BY	METHOD
Cyanide, Total	ND	0.010	mg/L	05/14/97 JWR	335.2
Fluoride	ND	0.10	mg/L	05/13/97 REB	340.2
pH (Laboratory)	6.2		S.U.	05/09/97 DJP	150.1
Specific Conductance	420	1	umho/cm	05/12/97 RJS	120.1
Arsenic, Dissolved	ND	0.004	mg/L	05/15/97 KHA	7060
Beryllium, Dissolved	ND	0.0005	mg/L	05/27/97 KHA	7091
Manganese, Dissolved	0.6	0.01	mg/L	05/19/97 AJS	6010A
Sodium, Dissolved	18	0.5	mg/L	05/19/97 AJS	6010A
Vanadium, Dissolved	ND	0.01	mg/L	05/19/97 AJS	6010A

**SAMPLE ID: 04 MW-18 Collected: 05/08/97 Category: Water**

TEST DESCRIPTION	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED BY	METHOD
Cyanide, Amenable to Cl	ND	0.50	mg/L	05/20/97 JWR	335.1
Cyanide, Total	8.7	0.50	mg/L	05/14/97 JWR	335.2
Fluoride	200	5.0	mg/L	05/13/97 REB	340.2
pH (Laboratory)	9.7		S.U.	05/09/97 DJP	150.1
Specific Conductance	4000	1	umho/cm	05/12/97 RJS	120.1
Arsenic, Dissolved	0.078	0.008	mg/L	05/15/97 KHA	7060
Beryllium, Dissolved	0.0009	0.0005	mg/L	05/27/97 KHA	7091
Manganese, Dissolved	0.29	0.01	mg/L	05/19/97 AJS	6010A
Sodium, Dissolved	1100	10	mg/L	05/19/97 AJS	6010A
Vanadium, Dissolved	0.02	0.01	mg/L	05/19/97 AJS	6010A

**SAMPLE ID: 05 MW-2 Collected: 05/08/97 Category: Water**

TEST DESCRIPTION	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED BY	METHOD
Cyanide, Amenable to Cl	ND	1.0	mg/L	05/20/97 JWR	335.1
Cyanide, Total	17	1.0	mg/L	05/14/97 JWR	335.2
Fluoride	63	5.0	mg/L	05/13/97 REB	340.2
pH (Laboratory)	10.1		S.U.	05/09/97 DJP	150.1

**NOTES AND DEFINITIONS:**

ND = Not detected at or above the reporting limit

**KEMRON ENVIRONMENTAL SERVICES**  
**RESULTS BY SAMPLE**

SAMPLE ID: 05 MW-2 Collected: 05/08/97 Category: Water

TEST DESCRIPTION	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED BY	METHOD
Specific Conductance	2100	1	umho/cm	05/13/97	DJP 120.1
Arsenic, Dissolved	0.092	0.008	mg/L	05/15/97	KHA 7060
Beryllium, Dissolved	0.001	0.0005	mg/L	05/27/97	KHA 7091
Manganese, Dissolved	1	0.01	mg/L	05/19/97	AJS 6010A
Sodium, Dissolved	470	5	mg/L	05/19/97	AJS 6010A
Vanadium, Dissolved	0.06	0.01	mg/L	05/19/97	AJS 6010A

SAMPLE ID: 06 MW-5 Collected: 05/08/97 Category: Water

TEST DESCRIPTION	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED BY	METHOD
Cyanide, Amenable to Cl	ND	0.25	mg/L	05/20/97	JWR 335.1
Cyanide, Total	3.5	0.25	mg/L	05/14/97	JWR 335.2
Fluoride	16	0.50	mg/L	05/13/97	REB 340.2
pH (Laboratory)	9.0		S.U.	05/09/97	DJP 150.1
Specific Conductance	1500	1	umho/cm	05/13/97	DJP 120.1
Arsenic, Dissolved	0.015	0.004	mg/L	05/15/97	KHA 7060
Beryllium, Dissolved	ND	0.0005	mg/L	05/27/97	KHA 7091
Manganese, Dissolved	0.4	0.01	mg/L	05/19/97	AJS 6010A
Sodium, Dissolved	310	5	mg/L	05/19/97	AJS 6010A
Vanadium, Dissolved	ND	0.01	mg/L	05/19/97	AJS 6010A

SAMPLE ID: 07 MW-7 Collected: 05/08/97 Category: Water

TEST DESCRIPTION	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED BY	METHOD
Cyanide, Total	ND	0.010	mg/L	05/14/97	JWR 335.2
Fluoride	0.10	0.10	mg/L	05/13/97	REB 340.2
pH (Laboratory)	5.6		S.U.	05/09/97	DJP 150.1
Specific Conductance	790	1	umho/cm	05/13/97	DJP 120.1
Arsenic, Dissolved	0.038	0.004	mg/L	05/15/97	KHA 7060
Beryllium, Dissolved	ND	0.0005	mg/L	05/27/97	KHA 7091
Manganese, Dissolved	2.2	0.01	mg/L	05/19/97	AJS 6010A
Sodium, Dissolved	89	0.5	mg/L	05/19/97	AJS 6010A
Vanadium, Dissolved	ND	0.01	mg/L	05/19/97	AJS 6010A

SAMPLE ID: 08 MW-8 Collected: 05/08/97 Category: Water

TEST DESCRIPTION	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED BY	METHOD
Cyanide, Amenable to Cl	ND	0.010	mg/L	05/20/97	JWR 335.1
Cyanide, Total	0.040	0.010	mg/L	05/14/97	JWR 335.2
Fluoride	2.2	0.10	mg/L	05/13/97	REB 340.2
pH (Laboratory)	7.8		S.U.	05/09/97	DJP 150.1
Specific Conductance	560	1	umho/cm	05/13/97	DJP 120.1
Arsenic, Dissolved	ND	0.004	mg/L	05/15/97	KHA 7060
Beryllium, Dissolved	ND	0.0005	mg/L	05/27/97	KHA 7091
Manganese, Dissolved	0.12	0.01	mg/L	05/19/97	AJS 6010A
Sodium, Dissolved	44	0.5	mg/L	05/19/97	AJS 6010A
Vanadium, Dissolved	ND	0.01	mg/L	05/19/97	AJS 6010A

**NOTES AND DEFINITIONS:**

ND = Not detected at or above the reporting limit

**KEMRON ENVIRONMENTAL SERVICES**  
**RESULTS BY SAMPLE**

SAMPLE ID: 09 MW-10 Collected: 05/08/97 Category: Water

TEST DESCRIPTION	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED BY	METHOD
Cyanide, Total	ND	0.010	mg/L	05/14/97 JWR	335.2
Fluoride	0.70	0.10	mg/L	05/20/97 SCM	340.2
pH (Laboratory)	7.2		S.U.	05/09/97 DJP	150.1
Specific Conductance	670	1	umho/cm	05/13/97 DJP	120.1
Arsenic, Dissolved	ND	0.004	mg/L	05/15/97 KHA	7060
Beryllium, Dissolved	ND	0.0005	mg/L	05/27/97 KHA	7091
Manganese, Dissolved	ND	0.01	mg/L	05/19/97 AJS	6010A
Sodium, Dissolved	25	0.5	mg/L	05/19/97 AJS	6010A
Vanadium, Dissolved	ND	0.01	mg/L	05/19/97 AJS	6010A

SAMPLE ID: 10 MW-DUP-2 Collected: 05/08/97 Category: Water

TEST DESCRIPTION	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED BY	METHOD
Cyanide, Total	ND	0.010	mg/L	05/14/97 JWR	335.2
Fluoride	0.20	0.10	mg/L	05/20/97 SCM	340.2
pH (Laboratory)	5.7		S.U.	05/09/97 DJP	150.1
Specific Conductance	800	1	umho/cm	05/13/97 DJP	120.1
Arsenic, Dissolved	0.038	0.004	mg/L	05/15/97 KHA	7060
Beryllium, Dissolved	ND	0.0005	mg/L	05/27/97 KHA	7091
Manganese, Dissolved	2.2	0.01	mg/L	05/19/97 AJS	6010A
Sodium, Dissolved	84	0.5	mg/L	05/19/97 AJS	6010A
Vanadium, Dissolved	ND	0.01	mg/L	05/19/97 AJS	6010A

SAMPLE ID: 11 MW-DUP-3 Collected: 05/08/97 Category: Water

TEST DESCRIPTION	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED BY	METHOD
Cyanide, Total	6.2	0.25	mg/L	05/14/97 JWR	335.2
Fluoride	93	5.0	mg/L	05/13/97 REB	340.2
pH (Laboratory)	9.9		S.U.	05/09/97 DJP	150.1
Specific Conductance	2500	1	umho/cm	05/13/97 DJP	120.1
Arsenic, Dissolved	0.038	0.004	mg/L	05/15/97 KHA	7060
Beryllium, Dissolved	0.0008	0.0005	mg/L	05/27/97 KHA	7091
Manganese, Dissolved	0.74	0.01	mg/L	05/19/97 AJS	6010A
Sodium, Dissolved	480	5	mg/L	05/19/97 AJS	6010A
Vanadium, Dissolved	0.05	0.01	mg/L	05/19/97 AJS	6010A

**NOTES AND DEFINITIONS:**

ND = Not detected at or above the reporting limit

Order # 97-05-156  
May 30, 1997 13:13

**KEMRON ENVIRONMENTAL SERVICES**  
**TEST RESULTS BY SAMPLE**

Page 5

Test Code: **826-SPE-VO**  
Sample Description: **TRIP BLANK #1**  
Test Description: **Special List - 8260**

Lab No: **01**

Collected: **05/08/97**  
Category: **Water**  
Method: **8260A**

Analyst: **SLT**  
Instrument: **HPMS1**      Injected: **05/14/97**      File: **1OR21326**  
Factor: **1**      Units: **ug/L**

CAS#	COMPOUND	RESULT	REPORTING LIMIT
127-18-4	Tetrachloroethene	ND	5

**SURROGATES:**

Dibromofluoromethane	<u>103</u> % Recovery	(86% - 118%)
1,2-Dichloroethane-d4	<u>110</u> % Recovery	(80% - 120%)
Toluene-d8	<u>101</u> % Recovery	(88% - 110%)
p-Bromofluorobenzene	<u>100</u> % Recovery	(86% - 115%)

**NOTES AND DEFINITIONS FOR THIS SAMPLE:**

ND = Not detected at or above the reporting limit

Order # 97-05-156  
May 30, 1997 13:13

**KEMRON ENVIRONMENTAL SERVICES**  
**TEST RESULTS BY SAMPLE**

Page 6

Test Code: **826-SPE-VO**  
Sample Description: **MW-31**  
Test Description: **Special List - 8260**

Lab No: **02**

Collected: **05/08/97**  
Category: **Water**  
Method: **8260A**

Analyst: **SLT**  
Instrument: **HPMS1**      Injected: **05/14/97**      File: **1OR21327**  
Factor: **1**      Units: **ug/L**

CAS#	COMPOUND	RESULT	REPORTING LIMIT
127-18-4	Tetrachloroethene	28	5

**SURROGATES:**

Dibromofluoromethane	<u>105</u> % Recovery	(86% - 118%)
1,2-Dichloroethane-d4	<u>109</u> % Recovery	(80% - 120%)
Toluene-d8	<u>109</u> % Recovery	(88% - 110%)
p-Bromofluorobenzene	<u>105</u> % Recovery	(86% - 115%)

**NOTES AND DEFINITIONS FOR THIS SAMPLE:**



Order # 97-05-156  
May 30, 1997 13:13

**KEMRON ENVIRONMENTAL SERVICES**  
**TEST RESULTS BY SAMPLE**

Page 7

Test Code: **826-SPE-VO**  
Sample Description: **MW-30**  
Test Description: **Special List - 8260**

Lab No: **03**

Collected: **05/08/97**  
Category: **Water**  
Method: **8260A**

Analyst: **SLT**  
Instrument: **HPMS1**      Injected: **05/19/97**      File: **1OR21414**  
Factor: **1**      Units: **ug/L**

CAS#	COMPOUND	RESULT	REPORTING LIMIT
127-18-4	Tetrachloroethene	12	5

**SURROGATES:**

Dibromofluoromethane	<u>92.4</u>	% Recovery	(86% - 118%)
1,2-Dichloroethane-d4	<u>90.7</u>	% Recovery	(80% - 120%)
Toluene-d8	<u>102</u>	% Recovery	(88% - 110%)
p-Bromofluorobenzene	<u>94.5</u>	% Recovery	(86% - 115%)

**NOTES AND DEFINITIONS FOR THIS SAMPLE:**

Order # 97-05-156  
May 30, 1997 13:13

**KEMRON ENVIRONMENTAL SERVICES**  
**TEST RESULTS BY SAMPLE**

Page 8

Test Code: **826-SPE-VO**  
Sample Description: **MW-18**  
Test Description: **Special List - 8260**

Lab No: **04**

Collected: **05/08/97**  
Category: **Water**  
Method: **8260A**

Analyst: **MDA**  
Instrument: **HPMS2**      Injected: **05/20/97**      File: **2OR16749**  
Factor: **1**      Units: **ug/L**

CAS#	COMPOUND	RESULT	REPORTING LIMIT
127-18-4	Tetrachloroethene	13	5

**SURROGATES:**

Dibromofluoromethane	<u>105</u> % Recovery	(86% - 118%)
1,2-Dichloroethane-d4	<u>98.6</u> % Recovery	(80% - 120%)
Toluene-d8	<u>98.7</u> % Recovery	(88% - 110%)
p-Bromofluorobenzene	<u>108</u> % Recovery	(86% - 115%)

**NOTES AND DEFINITIONS FOR THIS SAMPLE:**

Order # 97-05-156  
May 30, 1997 13:13

**KEMRON ENVIRONMENTAL SERVICES**  
**TEST RESULTS BY SAMPLE**

Page 9

Test Code: **826-SPE-VO**  
Sample Description: **MW-2**  
Test Description: **Special List - 8260**

Lab No: **05**

Collected: **05/08/97**  
Category: **Water**  
Method: **8260A**

Analyst: **SLT**  
Instrument: **HPMS1**      Injected: **05/19/97**      File: **1OR21416**  
Factor: **1**      Units: **ug/L**

CAS#	COMPOUND	RESULT	REPORTING LIMIT
127-18-4	Tetrachloroethene	8	5

**SURROGATES:**

Dibromofluoromethane	<u>90.4</u>	% Recovery (86% - 118%)
1,2-Dichloroethane-d4	<u>90.9</u>	% Recovery (80% - 120%)
Toluene-d8	<u>106</u>	% Recovery (88% - 110%)
p-Bromofluorobenzene	<u>95.4</u>	% Recovery (86% - 115%)

**NOTES AND DEFINITIONS FOR THIS SAMPLE:**

Order # 97-05-156  
May 30, 1997 13:13

**KEMRON ENVIRONMENTAL SERVICES**  
**TEST RESULTS BY SAMPLE**

Page 10

Test Code: **826-SPE-VO**  
Sample Description: **MW-5**  
Test Description: **Special List - 8260**

Lab No: **06**

Collected: **05/08/97**  
Category: **Water**  
Method: **8260A**

Analyst: **SLT**  
Instrument: **HPMS1**      Injected: **05/19/97**      File: **1OR21417**  
Factor: **1**      Units: **ug/L**

CAS#	COMPOUND	RESULT	REPORTING LIMIT
127-18-4	Tetrachloroethene	ND	5

**SURROGATES:**

Dibromofluoromethane	<u>91.5</u>	% Recovery	(86% - 118%)
1,2-Dichloroethane-d4	<u>92.2</u>	% Recovery	(80% - 120%)
Toluene-d8	<u>104</u>	% Recovery	(88% - 110%)
p-Bromofluorobenzene	<u>94.2</u>	% Recovery	(86% - 115%)

**NOTES AND DEFINITIONS FOR THIS SAMPLE:**

ND = Not detected at or above the reporting limit

Order # 97-05-156  
May 30, 1997 13:13

**KEMRON ENVIRONMENTAL SERVICES**  
**TEST RESULTS BY SAMPLE**

Page 11

Test Code: **826-SPE-VO**  
Sample Description: **MW-DUP-3**  
Test Description: **Special List - 8260**

Lab No: **11**

Collected: **05/08/97**  
Category: **Water**  
Method: **8260A**

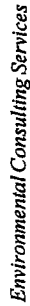
Analyst: **SLT**  
Instrument: **HPMS1**      Injected: **05/19/97**      File: **1OR21418**  
Factor: **1**      Units: **ug/L**

CAS#	COMPOUND	RESULT	REPORTING LIMIT
127-18-4	Tetrachloroethene	29	5

**SURROGATES:**

Dibromofluoromethane	<u>89.4</u>	% Recovery	(86% - 118%)
1,2-Dichloroethane-d4	<u>88.9</u>	% Recovery	(80% - 120%)
Toluene-d8	<u>103</u>	% Recovery	(88% - 110%)
p-Bromofluorobenzene	<u>92</u>	% Recovery	(86% - 115%)

**NOTES AND DEFINITIONS FOR THIS SAMPLE:**



# CHAIN-OF-CUSTODY RECORD

[illegible]

Relinquished by: <i>[Signature]</i>	Organization: <i>HydroSystems Management Inc</i>	Date: <i>5-8-97</i>	Time: <i>1615</i>	Seal Intact? <i>(Yes)</i>
Received by: <i>[Signature]</i>	Organization: <i>HydroSystems Management Inc</i>	Date: <i>5-8-97</i>	Time: <i>1615</i>	Seal Intact? <i>(Yes)</i>
Relinquished by: <i>[Signature]</i>	Organization: <i>HydroSystems Management Inc</i>	Date: <i>5-8-97</i>	Time: <i>1713</i>	Seal Intact? <i>(Yes)</i>
Received by: <i>[Signature]</i>	Organization: <i>HydroSystems Management Inc</i>	Date: <i>5/9/97</i>	Time: <i>800</i>	Seal Intact? <i>(Yes)</i>

REMARKS: Cooler temp 9c (put in locked walk-in) Sx's rec'd contact  
Cous?

DELIVERY METHOD:	In Person	Common Carrier	Lab Courier	Other
			Kendon	



APPENDIX B-2

LABORATORY ANALYTICAL REPORT FOR MAY 1998 MONITORING EVENT



KEMRON Environmental Services  
 109 Starlite Park  
 Marietta, Ohio 45750  
 Phone: (614) 373-4071

Ormet Corporation  
 Hydrosystems Management Inc.  
 331 S. Main Street, Suite 109  
 Washington, PA 15301  
 Attention: Bob Fargo

Login #: L9805079  
 Report Date: 05/21/98  
 Work ID: HM003.07/ORMET/HANNIBAL, OH  
 Date Received: 05/05/98


PO Number:  
 Account Number: ORMET-086

# SAMPLE IDENTIFICATION

Sample Number	Sample Description	Sample Number	Sample Description
L9805079-01	MW-15	L9805079-02	MW-19
L9805079-03	MW-32	L9805079-04	MW-32D
L9805079-05	MW-35	L9805079-06	MW-37
L9805079-07	MW-41	L9805079-08	MW-8
L9805079-09	MW-10	L9805079-10	MW-7
L9805079-11	MW-11	L9805079-12	MW-11D
L9805079-13	MW-1	L9805079-14	MW-28
L9805079-15	MW-40D	L9805079-16	MW-40S
L9805079-17	MW-39S	L9805079-18	MW-39D

All results on solids/sludges are reported on a dry weight basis, where applicable, unless otherwise specified. This report shall not be reproduced, except in full, without the written approval of KEMRON.

NYSDOH ELAP ID: 10861

  
 Certified By  
 Deanna Hesson

Login #L9802-19  
May 21, 1998 08:46 am

KEMRON ENVIRONMENTAL SERVICES

Lab Sample ID: L9805079-01

Client Sample ID: MW-15

Site/Work ID: HM003.07/ORMET/HANNIBAL, OH

Matrix: Water

Collected: 05/04/98 N/A

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total	mg/L	0.49		0.02	2	N/A	JWR	05/07/98	09:00	335.4\9010
Cyanide, Amenable to Cl	mg/L	0.02		0.01	1	N/A	JWR	05/18/98	09:00	335.1
Specific Conductance	umho/cm	610		1.0	1	N/A	MAR	05/11/98	15:40	120.1
Fluoride	mg/L	0.40		0.10	1	N/A	DLN	05/07/98	13:00	340.2
pH	S.U.	6.99			1	N/A	SJM	05/06/98	15:15	150.1
Arsenic, Dissolved	mg/L		ND	0.004	1	N/A	JYH	05/12/98	12:21	6010B
Beryllium, Dissolved	mg/L		ND	0.0005	1	N/A	JYH	05/12/98	12:21	6010B
Manganese, Dissolved	mg/L		ND	0.01	1	R-2	KHA	05/11/98	10:01	6010B
Sodium, Dissolved	mg/L	40		0.50	1	R-2	KHA	05/11/98	10:01	6010B
Vanadium, Dissolved	mg/L		ND	0.01	1	R-2	KHA	05/11/98	10:01	6010B

Lab Sample ID: L9805079-02

Client Sample ID: MW-19

Site/Work ID: HM003.07/ORMET/HANNIBAL, OH

Matrix: Water

Collected: 05/04/98 N/A

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total	mg/L		ND	0.01	1	N/A	JWR	05/07/98	09:00	335.4\9010
Specific Conductance	umho/cm	560		1.0	1	N/A	MAR	05/11/98	15:40	120.1
Fluoride	mg/L	1.4		0.10	1	N/A	DLN	05/07/98	13:00	340.2
pH	S.U.	7.23			1	N/A	SJM	05/06/98	15:15	150.1
Arsenic, Dissolved	mg/L		ND	0.008	2	R-2	KHA	05/13/98	14:41	6010B
Beryllium, Dissolved	mg/L		ND	0.0005	1	R-3	JYH	05/12/98	11:40	6010B
Manganese, Dissolved	mg/L		ND	0.01	1	N/A	KHA	05/11/98	10:01	6010B
Sodium, Dissolved	mg/L	23		0.50	1	N/A	KHA	05/11/98	10:01	6010B
Vanadium, Dissolved	mg/L		ND	0.01	1	N/A	KHA	05/11/98	10:01	6010B

RL = Reporting Limit

Login #L9805079  
May 21, 1998 08:46 am

KEMRON ENVIRONMENTAL SERVICES

Lab Sample ID: L9805079-03

Client Sample ID: MW-32

Site/Work ID: HM003.07/ORMET/HANNIBAL, OH

Matrix: Water

Collected: 05/04/98 N/A

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total.....	mg/L	2.5		0.10	10	N/A	JWR	05/07/98	09:00	335.4\9010
Cyanide, Amenable to Cl.....	mg/L	0.34		0.01	1	N/A	JWR	05/18/98	09:00	335.1
Specific Conductance.....	umho/cm	630		1.0	1	N/A	MAR	05/11/98	15:40	120.1
Fluoride.....	mg/L	7.7		0.10	1	N/A	DLN	05/07/98	13:00	340.2
pH .....	S.U.	8.03			1	N/A	SJM	05/06/98	15:15	150.1
Arsenic, Dissolved.....	mg/L		ND	0.004	1	N/A	JYH	05/12/98	11:58	6010B
Beryllium, Dissolved.....	mg/L		ND	0.0005	1	N/A	JYH	05/12/98	11:58	6010B
Manganese, Dissolved.....	mg/L	1.9		0.01	1	R-2	KHA	05/11/98	10:01	6010B
Sodium, Dissolved.....	mg/L	61		0.50	1	R-2	KHA	05/11/98	10:01	6010B
Vanadium, Dissolved.....	mg/L		ND	0.01	1	R-2	KHA	05/11/98	10:01	6010B

Lab Sample ID: L9805079-04

Client Sample ID: MW-32D

Site/Work ID: HM003.07/ORMET/HANNIBAL, OH

Matrix: Water

Collected: 05/04/98 N/A

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total.....	mg/L	2.5		0.10	10	N/A	JWR	05/07/98	09:00	335.4\9010
Cyanide, Amenable to Cl.....	mg/L	0.09		0.01	1	N/A	JWR	05/18/98	09:00	335.1
Specific Conductance.....	umho/cm	690		1.0	1	N/A	MAR	05/11/98	15:40	120.1
Fluoride.....	mg/L	8.0		0.10	1	N/A	DLN	05/07/98	13:00	340.2
pH .....	S.U.	8.05			1	N/A	SJM	05/06/98	15:15	150.1
Arsenic, Dissolved.....	mg/L		ND	0.004	1	N/A	JYH	05/12/98	12:25	6010B
Beryllium, Dissolved.....	mg/L		ND	0.0005	1	N/A	JYH	05/12/98	12:25	6010B
Manganese, Dissolved.....	mg/L	2.0		0.01	1	R-2	KHA	05/11/98	10:01	6010B
Sodium, Dissolved.....	mg/L	68		0.50	1	R-2	KHA	05/11/98	10:01	6010B
Vanadium, Dissolved.....	mg/L		ND	0.01	1	R-2	KHA	05/11/98	10:01	6010B

RL = Reporting Limit

Login #L9805079  
May 21, 1998 08:46 am

KEMRON ENVIRONMENTAL SERVICES

Lab Sample ID: L9805079-05

Client Sample ID: MW-35

Site/Work ID: HM003.07/ORMET/HANNIBAL, OH

Matrix: Water

Collected: 05/04/98 N/A

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total	mg/L	15		0.50	50	N/A	JWR	05/07/98	09:00	335.4\9010
Cyanide, Amenable to Cl	mg/L	2.9		0.01	1	N/A	JWR	05/18/98	09:00	335.1
Specific Conductance	umho/cm	710		1.0	1	N/A	MAR	05/11/98	15:40	120.1
Fluoride	mg/L	27		0.50	5	N/A	DLN	05/07/98	13:00	340.2
pH	S.U.	8.93			1	N/A	SJM	05/06/98	15:15	150.1
Arsenic, Dissolved	mg/L	0.012		0.004	1	N/A	JYH	05/12/98	12:30	6010B
Beryllium, Dissolved	mg/L		ND	0.0005	1	N/A	JYH	05/12/98	12:30	6010B
Manganese, Dissolved	mg/L	0.92		0.01	1	R-2	KHA	05/11/98	10:01	6010B
Sodium, Dissolved	mg/L	140		0.50	1	R-2	KHA	05/11/98	10:01	6010B
Vanadium, Dissolved	mg/L	0.01		0.01	1	R-2	KHA	05/11/98	10:01	6010B

Lab Sample ID: L9805079-06

Client Sample ID: MW-37

Site/Work ID: HM003.07/ORMET/HANNIBAL, OH

Matrix: Water

Collected: 05/04/98 N/A

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total	mg/L	6.4		0.50	50	N/A	JWR	05/07/98	09:00	335.4\9010
Cyanide, Amenable to Cl	mg/L		ND	0.01	1	N/A	JWR	05/18/98	09:00	335.1
Specific Conductance	umho/cm	530		1.0	1	N/A	MAR	05/11/98	15:40	120.1
Fluoride	mg/L	6.8		0.10	1	N/A	DLN	05/07/98	13:00	340.2
pH	S.U.	857			1	N/A	SJM	05/06/98	15:15	150.1
Arsenic, Dissolved	mg/L	0.018		0.004	1	N/A	JYH	05/12/98	12:38	6010B
Beryllium, Dissolved	mg/L		ND	0.0005	1	N/A	JYH	05/12/98	12:38	6010B
Manganese, Dissolved	mg/L	0.28		0.01	1	R-2	KHA	05/11/98	10:01	6010B
Sodium, Dissolved	mg/L	120		0.50	1	R-2	KHA	05/11/98	10:01	6010B
Vanadium, Dissolved	mg/L	0.02		0.01	1	R-2	KHA	05/11/98	10:01	6010B

RL = Reporting Limit

Login #L9805079  
May 21, 1998 08:46 am

KEMRON ENVIRONMENTAL SERVICES

Lab Sample ID: L9805079-07

Client Sample ID: MW-41

Site/Work ID: HM003.07/ORMET/HANNIBAL, OH

Matrix: Water

Collected: 05/04/98 N/A

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total	mg/L		ND	0.01	1	N/A	JWR	05/07/98	09:00	335.4\9010
Specific Conductance	umho/cm	420		1.0	1	N/A	MAR	05/11/98	15:40	120.1
Fluoride	mg/L	0.30		0.10	1	N/A	DLN	05/07/98	13:00	340.2
pH	S.U.	6.67			1	N/A	SJM	05/06/98	15:15	150.1
Arsenic, Dissolved	mg/L	0.016		0.004	1	N/A	JYH	05/12/98	12:43	6010B
Beryllium, Dissolved	mg/L		ND	0.0005	1	N/A	JYH	05/12/98	12:43	6010B
Manganese, Dissolved	mg/L	1.3		0.01	1	R-2	KHA	05/11/98	10:01	6010B
Sodium, Dissolved	mg/L	21		0.50	1	R-2	KHA	05/11/98	10:01	6010B
Vanadium, Dissolved	mg/L		ND	0.01	1	R-2	KHA	05/11/98	10:01	6010B

Lab Sample ID: L9805079-08

Client Sample ID: MW-8

Site/Work ID: HM003.07/ORMET/HANNIBAL, OH

Matrix: Water

Collected: 05/05/98 N/A

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total	mg/L	0.02	ND	0.01	1	N/A	JWR	05/07/98	09:00	335.4\9010
Amenable to Cl	mg/L			0.01	1	N/A	JWR	05/19/98	08:00	335.1
Specific Conductance	umho/cm	490		1.0	1	N/A	MAR	05/11/98	15:40	120.1
Fluoride	mg/L	2.3		0.10	1	N/A	DLN	05/07/98	13:00	340.2
pH	S.U.	7.81			1	N/A	SJM	05/06/98	15:15	150.1
Arsenic, Dissolved	mg/L		ND	0.004	1	N/A	JYH	05/12/98	12:47	6010B
Beryllium, Dissolved	mg/L		ND	0.0005	1	N/A	JYH	05/12/98	12:47	6010B
Manganese, Dissolved	mg/L	0.14		0.01	1	R-2	KHA	05/11/98	10:01	6010B
Sodium, Dissolved	mg/L	30		0.50	1	R-2	KHA	05/11/98	10:01	6010B
Vanadium, Dissolved	mg/L		ND	0.01	1	R-2	KHA	05/11/98	10:01	6010B

RL = Reporting Limit

Login #L9805079  
May 21, 1998 08:46 am

KEMRON ENVIRONMENTAL SERVICES

Lab Sample ID: L9805079-09

Client Sample ID: MW-10

Site/Work ID: HM003.07/ORMET/HANNIBAL, OH

Matrix: Water

Collected: 05/05/98 N/A

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total	mg/L	0.15		0.01	1	N/A	JWR	05/07/98	09:00	335.4\9010
Cyanide, Amenable to Cl	mg/L	0.01		0.01	1	N/A	JWR	05/19/98	08:00	335.1
Specific Conductance	umho/cm	970		1.0	1	N/A	MAR	05/11/98	15:40	120.1
Fluoride	mg/L	0.60		0.10	1	N/A	DLN	05/07/98	13:00	340.2
pH	S.U.	7.22			1	N/A	SJM	05/06/98	15:15	150.1
Arsenic, Dissolved	mg/L		ND	0.008	2	R-2	KHA	05/13/98	14:45	6010B
Beryllium, Dissolved	mg/L		ND	0.0005	1	R-3	JYH	05/12/98	13:18	6010B
Manganese, Dissolved	mg/L		ND	0.01	1	N/A	KHA	05/11/98	10:01	6010B
Sodium, Dissolved	mg/L	120		0.50	1	N/A	KHA	05/11/98	10:01	6010B
Vanadium, Dissolved	mg/L		ND	0.01	1	N/A	KHA	05/11/98	10:01	6010B

Lab Sample ID: L9805079-10

Client Sample ID: MW-7

Site/Work ID: HM003.07/ORMET/HANNIBAL, OH

Matrix: Water

Collected: 05/05/98 N/A

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total	mg/L		ND	0.01	1	N/A	JWR	05/07/98	09:00	335.4\9010
Specific Conductance	umho/cm	770		1.0	1	N/A	MAR	05/11/98	15:40	120.1
Fluoride	mg/L	0.20		0.10	1	N/A	DLN	05/07/98	13:00	340.2
pH	S.U.	5.71			1	N/A	SJM	05/06/98	15:15	150.1
Arsenic, Dissolved	mg/L	0.051		0.004	1	N/A	JYH	05/12/98	13:23	6010B
Beryllium, Dissolved	mg/L		ND	0.0005	1	N/A	JYH	05/12/98	13:23	6010B
Manganese, Dissolved	mg/L	2.2		0.01	1	R-2	KHA	05/11/98	10:01	6010B
Sodium, Dissolved	mg/L	78		0.50	1	R-2	KHA	05/11/98	10:01	6010B
Vanadium, Dissolved	mg/L		ND	0.01	1	R-2	KHA	05/11/98	10:01	6010B

RL = Reporting Limit

Login #L980579  
May 21, 1998 08:46 am

KEMRON ENVIRONMENTAL SERVICES

Lab Sample ID: L9805079-11

Client Sample ID: MW-11

Site/Work ID: HM003.07/ORMET/HANNIBAL, OH

Matrix: Water

Collected: 05/05/98 N/A

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total.....	mg/L	0.02		0.01	1	N/A	JWR	05/07/98	09:00	335.4\9010
Cyanide, Amenable to Cl.....	mg/L		ND	0.01	1	N/A	JWR	05/19/98	08:00	335.1
Specific Conductance.....	umho/cm	490		1.0	1	N/A	MAR	05/11/98	15:40	120.1
Fluoride.....	mg/L	1.7		0.10	1	N/A	DLN	05/07/98	13:00	340.2
pH .....	S.U.	7.84			1	N/A	SJM	05/06/98	15:15	150.1
Arsenic, Dissolved.....	mg/L		ND	0.004	1	N/A	JYH	05/12/98	13:27	6010B
Beryllium, Dissolved.....	mg/L		ND	0.0005	1	N/A	JYH	05/12/98	13:27	6010B
Manganese, Dissolved.....	mg/L	0.45		0.01	1	R-2	KHA	05/11/98	10:01	6010B
Sodium, Dissolved.....	mg/L	31		0.50	1	R-2	KHA	05/11/98	10:01	6010B
Vanadium, Dissolved.....	mg/L		ND	0.01	1	R-2	KHA	05/11/98	10:01	6010B

Lab Sample ID: L9805079-12

Client Sample ID: MW-11D

Site/Work ID: HM003.07/ORMET/HANNIBAL, OH

Matrix: Water

Collected: 05/05/98 N/A

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total.....	mg/L	0.02		0.01	1	N/A	JWR	05/07/98	09:00	335.4\9010
Cyanide, Amenable to Cl.....	mg/L		ND	0.01	1	N/A	JWR	05/19/98	08:00	335.1
Specific Conductance.....	umho/cm	500		1.0	1	N/A	MAR	05/15/98	13:15	120.1
Fluoride.....	mg/L	1.7		0.10	1	N/A	DLN	05/07/98	13:00	340.2
pH .....	S.U.	7.85			1	N/A	SJM	05/06/98	15:15	150.1
Arsenic, Dissolved.....	mg/L		ND	0.004	1	N/A	JYH	05/12/98	13:32	6010B
Beryllium, Dissolved.....	mg/L		ND	0.0005	1	N/A	JYH	05/12/98	13:32	6010B
Manganese, Dissolved.....	mg/L	0.43		0.01	1	R-2	KHA	05/11/98	10:01	6010B
Sodium, Dissolved.....	mg/L	29		0.50	1	R-2	KHA	05/11/98	10:01	6010B
Vanadium, Dissolved.....	mg/L		ND	0.01	1	R-2	KHA	05/11/98	10:01	6010B

RL = Reporting Limit

Login #L98079  
May 21, 1998 08:46 am

KEMRON ENVIRONMENTAL SERVICES

Lab Sample ID: L9805079-13

Client Sample ID: MW-1

Site/Work ID: HM003.07/ORMET/HANNIBAL, OH

Matrix: Water

Collected: 05/05/98 N/A

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total	mg/L		ND	0.01	1	N/A	JWR	05/07/98	09:00	335.4\9010
Specific Conductance	umho/cm	480		1.0	1	N/A	MAR	05/15/98	13:15	120.1
Fluoride	mg/L	0.20		0.10	1	N/A	DLN	05/07/98	13:00	340.2
pH	S.U.	6.01			1	N/A	SJM	05/06/98	15:15	150.1
Arsenic, Dissolved	mg/L		ND	0.004	1	N/A	JYH	05/12/98	13:36	6010B
Beryllium, Dissolved	mg/L		ND	0.0005	1	N/A	JYH	05/12/98	13:36	6010B
Manganese, Dissolved	mg/L	0.10		0.01	1	R-2	KHA	05/11/98	10:01	6010B
Sodium, Dissolved	mg/L	20		0.50	1	R-2	KHA	05/11/98	10:01	6010B
Vanadium, Dissolved	mg/L		ND	0.01	1	R-2	KHA	05/11/98	10:01	6010B

Lab Sample ID: L9805079-14

Client Sample ID: MW-28

Site/Work ID: HM003.07/ORMET/HANNIBAL, OH

Matrix: Water

Collected: 05/05/98 N/A

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total	mg/L		ND	0.01	1	N/A	JWR	05/07/98	09:00	335.4\9010
Cyanide, Amenable to Cl	mg/L	0.12		0.01	1	N/A	JWR	05/19/98	08:00	335.1
Specific Conductance	umho/cm	500		1.0	1	N/A	MAR	05/15/98	13:15	120.1
Fluoride	mg/L	0.20		0.10	1	N/A	DLN	05/07/98	13:00	340.2
pH	S.U.	5.74			1	N/A	SJM	05/06/98	15:15	150.1
Arsenic, Dissolved	mg/L		ND	0.004	1	N/A	JYH	05/12/98	13:41	6010B
Beryllium, Dissolved	mg/L		ND	0.0005	1	N/A	JYH	05/12/98	13:41	6010B
Manganese, Dissolved	mg/L	0.01		0.01	1	R-2	KHA	05/11/98	10:01	6010B
Sodium, Dissolved	mg/L	65		0.50	1	R-2	KHA	05/11/98	10:01	6010B
Vanadium, Dissolved	mg/L		ND	0.01	1	R-2	KHA	05/11/98	10:01	6010B

RL = Reporting Limit



Login #L980079  
May 21, 1998 08:46 am

KEMRON ENVIRONMENTAL SERVICES

Lab Sample ID: L9805079-15

Client Sample ID: MW-40D

Site/Work ID: HM003.07/ORMET/HANNIBAL, OH

Matrix: Water

Collected: 05/05/98 N/A

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total	mg/L	0.49		0.02	2	N/A	JWR	05/07/98	09:00	335.4\9010
Cyanide, Amenable to Cl	mg/L	0.47		0.01	1	N/A	JWR	05/19/98	08:00	335.1
Specific Conductance	umho/cm	1300		1.0	1	N/A	MAR	05/15/98	13:15	120.1
Fluoride	mg/L	19		0.50	5	N/A	DLN	05/07/98	13:00	340.2
pH	S.U.	7.85			1	N/A	SJM	05/06/98	15:15	150.1
Arsenic, Dissolved	mg/L		ND	0.004	1	R-2	JYH	05/12/98	13:45	6010B
Beryllium, Dissolved	mg/L		ND	0.0005	1	R-2	JYH	05/12/98	13:45	6010B
Manganese, Dissolved	mg/L	0.36		0.01	1	N/A	KHA	05/11/98	10:01	6010B
Sodium, Dissolved	mg/L	250		0.50	1	R-2	JYH	05/12/98	13:45	6010B
Vanadium, Dissolved	mg/L		ND	0.01	1	N/A	KHA	05/11/98	10:01	6010B

Lab Sample ID: L9805079-16

Client Sample ID: MW-40S

Site/Work ID: HM003.07/ORMET/HANNIBAL, OH

Matrix: Water

Collected: 05/05/98 N/A

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total	mg/L	0.36		0.02	2	N/A	JWR	05/07/98	09:00	335.4\9010
Cyanide, Amenable to Cl	mg/L		ND	0.01	1	N/A	JWR	05/19/98	08:00	335.1
Specific Conductance	umho/cm	1400		1.0	1	N/A	MAR	05/15/98	13:15	120.1
Fluoride	mg/L	39		0.50	5	N/A	DLN	05/07/98	13:00	340.2
pH	S.U.	8.20			1	N/A	SJM	05/06/98	15:15	150.1
Arsenic, Dissolved	mg/L		ND	0.004	1	R-2	JYH	05/12/98	13:49	6010B
Beryllium, Dissolved	mg/L		ND	0.0005	1	R-2	JYH	05/12/98	13:49	6010B
Manganese, Dissolved	mg/L	0.13		0.01	1	N/A	KHA	05/11/98	10:01	6010B
Sodium, Dissolved	mg/L	270		0.50	1	R-2	JYH	05/12/98	13:49	6010B
Vanadium, Dissolved	mg/L		ND	0.01	1	N/A	KHA	05/11/98	10:01	6010B

RL = Reporting Limit

Login #L986679  
May 21, 1998 08:46 am

KEMRON ENVIRONMENTAL SERVICES

Lab Sample ID: L9805079-17

Client Sample ID: MW-398

Site/Work ID: HM003.07/ORMET/HANNIBAL, OH

Matrix: Water

Collected: 05/05/98 N/A

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total	mg/L	2.3		0.10	10	N/A	JWR	05/07/98	09:00	335.4\9010
Cyanide, Amenable to Cl	mg/L		ND	0.01	1	N/A	JWR	05/19/98	08:00	335.1
Specific Conductance	umho/cm	4000		1.0	1	N/A	MAR	05/15/98	13:15	120.1
Fluoride	mg/L	98		2.5	25	N/A	DLN	05/07/98	13:00	340.2
pH	S.U.	9.04			1	N/A	SJM	05/06/98	15:15	150.1
Arsenic, Dissolved	mg/L			0.004	1	R-2	JYH	05/12/98	13:54	6010B
Beryllium, Dissolved	mg/L	0.009		0.0005	1	R-2	JYH	05/12/98	13:54	6010B
Manganese, Dissolved	mg/L		ND	0.01	1	N/A	KHA	05/11/98	10:01	6010B
Sodium, Dissolved	mg/L	700		0.50	1	R-3	JYH	05/14/98	11:55	6010B
Vanadium, Dissolved	mg/L		ND	0.01	1	N/A	KHA	05/11/98	10:01	6010B

Lab Sample ID: L9805079-18

Client Sample ID: MW-39D

Site/Work ID: HM003.07/ORMET/HANNIBAL, OH

Matrix: Water

Collected: 05/05/98 N/A

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total	mg/L	0.04		0.01	1	N/A	JWR	05/07/98	09:00	335.4\9010
Cyanide, Amenable to Cl	mg/L		ND	0.01	1	N/A	JWR	05/19/98	08:00	335.1
Specific Conductance	umho/cm	590		1.0	1	N/A	MAR	05/15/98	13:15	120.1
Fluoride	mg/L	3.6		0.10	1	N/A	DLN	05/07/98	13:00	340.2
pH	S.U.	7.52			1	N/A	SJM	05/06/98	15:15	150.1
Arsenic, Dissolved	mg/L			0.004	1	R-2	JYH	05/12/98	13:58	6010B
Beryllium, Dissolved	mg/L		ND	0.0005	1	R-2	JYH	05/12/98	13:58	6010B
Manganese, Dissolved	mg/L	0.77		0.01	1	N/A	KHA	05/11/98	10:01	6010B
Sodium, Dissolved	mg/L	34		0.50	1	R-2	JYH	05/12/98	13:58	6010B
Vanadium, Dissolved	mg/L		ND	0.01	1	N/A	KHA	05/11/98	10:01	6010B

RL = Reporting Limit



# CHAIN-OF-CUSTODY RECORD

Project Number	Project Name/Location	Container Description/ Number of Containers
H M003.07	Oremet/Hemibetal Acid Laboratory Kemron	
Sampling Personnel J Campbell , S Menosky		
Sample ID	Date/Time	Sample Code
MW-15	5-4-98	L
MW-19		
MW-32		
MW-32d		
MW-35		
MW-37		
MW-41	5-4-98	
MW-48	5-5-98	
MW-10		
MW-7		
MW-11		
MW-11d		
MW-1		
MW-28		
MW-40d		
TOTAL		45

**Sample Code: L = Liquid; S = Solid; A = Air**

Relinquished by:	Organization:	Date:	Time:	Seal Intact?
<i>[Signature]</i>	HML	5-5-98		
Received by:	Spice K. Warden	5-5-98	17:00	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> NA <input type="checkbox"/>
Relinquished by:	Spice K. Warden	5-5-98	18:00	
Received by:	Spice K. Warden	5-6-98	20:00	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> NA <input type="checkbox"/>

REMARKS: Run Total Cyanide first and if detectable results then run Amenable Cu (Asp) stored in Samples in 2 Coolers. Leached Cooler

Six road contact  
Cooler dumps 9.0

**DELIVERY METHOD:**

## In Person

## Common Carrier

Lab Courier  
Kemron B. D. D. D.

Other



# CHAIN-OF-CUSTODY RECORD

[illegible]

**Sample Code: L = Liquid; S = Solid; A = Air**

Relinquished by:	Organization:	Date:	Time:	Seal Intact?
				<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No NA
Received by: <i>[Signature]</i>	Kemron	Date: 5-5-98	Time: 17:00	
Relinquished by: <i>[Signature]</i>	Kemron	Date: 5-5-98	Time: 18:00	
Received by: <i>[Signature]</i>	Kemron	Date: 5-6-98	Time: 20:00	

REMARKS: Run Total Cn first and if detectable results then run Amenable Cn  
SXS need contact cooler Smps 4.0 ~~for~~ overnight bag

DELIVERY METHOD: ☐ In Person ☐ Common Carrier ☐ Lab Courier ☒ Kemron Other ☐

**DELIVERY METHOD:**

## In Person

## Common Carrier

Lab Courier

3

KEMRON Environmental Services  
109 Starlite Park  
Marietta, Ohio 45750  
Phone: (614) 373-4071

Ormet Corporation  
Hydrosystems Management Inc.  
331 S. Main Street, Suite 109  
Washington, PA 15301  
Attention: Bob Fargo

PO Number:  
Account Number: ORMET-086

Login #: L9805118  
Report Date: 05/21/98  
Work ID: HM003.07/ORMET/HANNIBAL, OH  
Date Received: 05/06/98

SAMPLE IDENTIFICATION

Sample Number	Sample Description	Sample Number	Sample Description
L9805118-01	MW-2	L9805118-02	MW-5
L9805118-03	MW-5D	L9805118-04	MW-18
L9805118-05	MW-30	L9805118-06	MW-31
L9805118-07	TRIP BLANK	L9805118-08	MW-12
L9805118-09	MW-42S	L9805118-10	MW-42D
L9805118-11	MW-16		

All results on solids/sludges are reported on a dry weight basis, where applicable,  
unless otherwise specified. This report shall not be reproduced,  
except in full, without the written approval of KEMRON.

NYSDOH ELAP ID: 10861

  
Certified By  
David L. Bumgarner

Login #L9805118-18  
May 21, 1998 08:41 am

KEMRON ENVIRONMENTAL SERVICES

Lab Sample ID: L9805118-01

Client Sample ID: MW-2

Site/Work ID: HM003.07/ORMET/HANNIBAL, OH

Matrix: Water

Collected: 05/06/98 N/A

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total.....	mg/L	13	ND	0.50	50	N/A	JWR	05/14/98	09:00	335.4\9010
Cyanide, Amenable to Cl.....	mg/L			0.01	1	N/A	JWR	05/19/98	08:00	335.1
Specific Conductance.....	umho/cm	1900		1.0	1	N/A	MAR	05/11/98	09:55	120.1
Fluoride.....	mg/L	68		1.0	10	N/A	MAR	05/15/98	08:20	340.2
pH .....	S.U.	9.98			1	N/A	SJM	05/07/98	17:35	150.1
Arsenic, Dissolved.....	mg/L	0.082		0.004	1	N/A	JYH	05/12/98	15:44	6010B
Beryllium, Dissolved.....	mg/L	0.001		0.0005	1	N/A	JYH	05/12/98	15:44	6010B
Manganese, Dissolved.....	mg/L	0.93		0.01	1	R-2	KHA	05/11/98	10:01	6010B
Sodium, Dissolved.....	mg/L	450		0.50	1	R-2	KHA	05/11/98	10:01	6010B
Vanadium, Dissolved.....	mg/L	0.06		0.01	1	R-2	KHA	05/11/98	10:01	6010B

Product: 826-SPE-VO - Special List - 8260

Lab Sample ID: L9805118-01

Client Sample ID: MW-2

Site/Work ID: HM003.07/ORMET/HANNIBAL, OH

Matrix: Water

Dil. Type: N/A

COC Info: N/A

Sample Weight: N/A

Extract Volume: N/A

Date Collected: 05/06/98

% Solid: N/A

TCLP Extract Date: N/A

Extract Date: N/A

Analysis Date: 05/14/98 Time: 20:13

Instrument: HPMS8

Analyst: JLH

Lab File ID: 8HY01924

Method: 8260B

Run ID: R46428

CAS #	Compound	Units	Result	Qualifiers	RL	Dilution
127-18-4	Tetrachloroethene.....	ug/L	5.3		5.0	1
SURROGATES- In Percent Recovery:						
	Dibromofluoromethane.....	105		( 86 - 118% )		
	1,2-Dichloroethane-d4.....	101		( 80 - 120% )		
	Toluene-d8.....	101		( 88 - 110% )		
	p-Bromofluorobenzene.....	109		( 86 - 115% )		

RL = Reporting Limit

Login #L9805118  
May 21, 1998 08:41 am

KEMRON ENVIRONMENTAL SERVICES

Lab Sample ID: L9805118-02

Client Sample ID: MW-5

Site/Work ID: HM003.07/ORMET/HANNIBAL, OH

Matrix: Water

Collected: 05/06/98 N/A

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total	mg/L	2.1	ND	0.10	10	N/A	JWR	05/14/98	09:00	335.4\9010
Cyanide, Amenable to Cl	mg/L			0.01	1	N/A	JWR	05/19/98	08:00	335.1
Specific Conductance	umho/cm	1400		1.0	1	N/A	JWR	05/11/98	09:55	120.1
Fluoride	mg/L	18		0.50	5	N/A	MAR	05/15/98	08:20	340.2
pH	S.U.	8.83			1	N/A	SJM	05/07/98	17:35	150.1
Arsenic, Dissolved	mg/L	0.007	ND	0.004	1	N/A	JYH	05/12/98	15:49	6010B
Beryllium, Dissolved	mg/L			0.0005	1	N/A	JYH	05/12/98	15:49	6010B
Manganese, Dissolved	mg/L	0.17		0.01	1	R-2	KHA	05/11/98	10:01	6010B
Sodium, Dissolved	mg/L	300		0.50	1	R-2	KHA	05/11/98	10:01	6010B
Vanadium, Dissolved	mg/L		ND	0.01	1	R-2	KHA	05/11/98	10:01	6010B

Product: 826-SPE-VO - Special List - 8260

Lab Sample ID: L9805118-02

Client Sample ID: MW-5

Site/Work ID: HM003.07/ORMET/HANNIBAL, OH

Matrix: Water

Dil. Type: N/A

COC Info: N/A

Sample Weight: N/A

Extract Volume: N/A

Date Collected: 05/06/98

% Solid: N/A

Instrument: HPMS8

Analyst: JLN

Method: 8260B

Lab File ID: 8HY01925

TCLP Extract Date: N/A  
Extract Date: N/A  
Analysis Date: 05/14/98 Time: 20:47

CAS #	Compound	Units	Result	Qualifiers	RL	Dilution
127-18-4	Tetrachloroethene	ug/L		ND	5.0	1
SURROGATES- In Percent Recovery:						
	Dibromofluoromethane	105		( 86 - 118%)		
	1,2-Dichloroethane-d4	104		( 80 - 120%)		
	Toluene-d8	100		( 88 - 110%)		
	p-Bromofluorobenzene	111		( 86 - 115%)		

RL = Reporting Limit

Login #L9805118  
May 21, 1998 08:41 am

KEMRON ENVIRONMENTAL SERVICES

Lab Sample ID: L9805118-03

Client Sample ID: MW-5D

Site/Work ID: HM003.07/ORMET/HANNIBAL, OH

Matrix: Water

Collected: 05/06/98 N/A

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total	mg/L	1.3	ND	0.05	5	N/A	JWR	05/14/98	09:00	335.4\9010
Cyanide, Amenable to Cl <sub>2</sub>	mg/L			0.01	1	N/A	JWR	05/19/98	08:00	335.1
Specific Conductance	umho/cm	1400		1.0	1	N/A	MAR	05/11/98	09:55	120.1
Fluoride	mg/L	18		0.50	5	N/A	MAR	05/15/98	08:20	340.2
pH	S.U.	8.83			1	N/A	SJM	05/07/98	17:35	150.1
Arsenic, Dissolved	mg/L	0.007	ND	0.004	1	N/A	JYH	05/12/98	15:53	6010B
Beryllium, Dissolved	mg/L			0.0005	1	N/A	JYH	05/12/98	15:53	6010B
Manganese, Dissolved	mg/L	0.18		0.01	1	R-2	KHA	05/11/98	10:01	6010B
Sodium, Dissolved	mg/L	300		0.50	1	R-2	KHA	05/11/98	10:01	6010B
Vanadium, Dissolved	mg/L		ND	0.01	1	R-2	KHA	05/11/98	10:01	6010B

Product: 826-SPX-VO - Special List - 8260

Lab Sample ID: L9805118-03

Client Sample ID: MW-5D

Site/Work ID: HM003.07/ORMET/HANNIBAL, OH

Matrix: Water

Dil. Type: N/A

COC Info: N/A

Sample Weight: N/A

Extract Volume: N/A

Date Collected: 05/06/98

% Solid: N/A

Instrument: HPMS8

Analyst: JLH

Method: 8260B

Lab File ID: 8HY01926

TCLP Extract Date: N/A

Extract Date: N/A

Analysis Date: 05/14/98 Time: 21:20

CAS #	Compound	Units	Result	Qualifiers	RL	Dilution
127-18-4	Tetrachloroethene	ug/L		ND	5.0	1
SURROGATES- In Percent Recovery:						
	Dibromofluoromethane	106		( 86 - 118%)		
	1,2-Dichloroethane-d4	104		( 80 - 120%)		
	Toluene-d8	101		( 88 - 110%)		
	p-Bromofluorobenzene	113		( 86 - 115%)		

RL = Reporting Limit



Login #L9805118  
May 21, 1998 08:41 am

KEMRON ENVIRONMENTAL SERVICES

Lab Sample ID: L9805118-04

Client Sample ID: MW-18

Site/Work ID: HM003.07/ORMET/HANNIBAL, OH

Matrix: Water

Collected: 05/06/98 N/A

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total	mg/L	9.8		0.25	25	N/A	JWR	05/14/98	09:00	335.4\9010
Cyanide, Amenable to Cl	mg/L	0.40		0.01	1	N/A	JWR	05/19/98	08:00	335.1
Specific Conductance	umho/cm	4200		1.0	1	N/A	JWR	05/11/98	09:55	120.1
Fluoride	mg/L	260		5.0	50	N/A	MAR	05/15/98	08:20	340.2
pH	S.U.	9.76		1	1	N/A	SJM	05/07/98	17:35	150.1
Arsenic, Dissolved	mg/L	0.094		0.008	2	N/A	JYH	05/12/98	15:58	6010B
Beryllium, Dissolved	mg/L	0.0014		0.001	2	N/A	JYH	05/12/98	15:58	6010B
Manganese, Dissolved	mg/L	0.49		0.01	1	R-2	KHA	05/11/98	10:01	6010B
Sodium, Dissolved	mg/L	1100		1.0	2	R-2	KHA	05/11/98	10:01	6010B
Vanadium, Dissolved	mg/L	0.05		0.01	1	R-2	KHA	05/11/98	10:01	6010B

Product: 826-SPE-VO - Special List - 8260

Lab Sample ID: L9805118-04

Client Sample ID: MW-18

Site/Work ID: HM003.07/ORMET/HANNIBAL, OH

Matrix: Water

Dil. Type: N/A

COC Info: N/A

Sample Weight: N/A

Extract Volume: N/A

Date Collected: 05/06/98

% Solid: N/A

Instrument: HPMS8

Analyst: JIH

Lab File ID: 8HY01927

Method: 8260B

Run ID: R46428

TCLP Extract Date: N/A  
Extract Date: N/A  
Analysis Date: 05/14/98 Time: 21:53

CAS #	Compound	Units	Result	Qualifiers	RL	Dilution
127-18-4	Tetrachloroethene	ug/L	24		5.0	1
SURROGATES- In Percent Recovery:						
	Dibromofluoromethane	107		( 86 - 118%)		
	1,2-Dichloroethane-d4	107		( 80 - 120%)		
	Toluene-d8	100		( 88 - 110%)		
	p-Bromofluorobenzene	110		( 86 - 115%)		

RL = Reporting Limit

LogIn #L9805118  
May 21, 1998 08:41 am

KEMRON ENVIRONMENTAL SERVICES

Lab Sample ID: L9805118-05

Client Sample ID: MW-30

Site/Work ID: HM003.07/ORMET/HANNIBAL, OH

Matrix: Water

Collected: 05/06/98 N/A

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total.....	mg/L		ND	0.01	1	N/A	JWR	05/14/98	09:00	335.4\9010
Specific Conductance.....	umho/cm	390		1.0	1	N/A	MAR	05/11/98	09:55	120.1
Fluoride.....	mg/L	0.10		0.10	1	N/A	MAR	05/15/98	08:20	340.2
pH .....	S.U.	6.19			1	N/A	SJM	05/07/98	17:35	150.1
Arsenic, Dissolved.....	mg/L		ND	0.004	1	N/A	JYH	05/12/98	16:02	6010B
Beryllium, Dissolved.....	mg/L		ND	0.0005	1	N/A	JYH	05/12/98	16:02	6010B
Manganese, Dissolved.....	mg/L	0.68		0.01	1	R-2	KHA	05/11/98	10:01	6010B
Sodium, Dissolved.....	mg/L	21		0.50	1	R-2	KHA	05/11/98	10:01	6010B
Vanadium, Dissolved.....	mg/L		ND	0.01	1	R-2	KHA	05/11/98	10:01	6010B

Product: 826-SPE-VO - Special List - 8260

Lab Sample ID: L9805118-05

Client Sample ID: MW-30

Site/Work ID: HM003.07/ORMET/HANNIBAL, OH

Matrix: Water

Dil. Type: N/A

COC Info: N/A

Date Collected: 05/06/98

TCLP Extract Date: N/A

Extract Date: N/A

Analysis Date: 05/14/98 Time: 22:26

Sample Weight: N/A

Extract Volume: N/A

% Solid: N/A

Method: 8260B

Run ID: R46428

CAS #	Compound	Units	Result	Qualifiers	RL	Dilution
127-18-4	Tetrachloroethene.....	ug/L	13		5.0	1
SURROGATES- In Percent Recovery:						
	Dibromofluoromethane.....	108		{ 86 - 118% }		
	1,2-Dichloroethane-d4.....	108		{ 80 - 120% }		
	Toluene-d8.....	101		{ 88 - 110% }		
	p-Bromofluorobenzene.....	112		{ 86 - 115% }		

RL = Reporting Limit

Login #L9805118  
May 21, 1998 08:41 am

KEMRON ENVIRONMENTAL SERVICES

Lab Sample ID: L9805118-06

Client Sample ID: MW-31

Site/Work ID: HM003.07/ORMET/HANNIBAL, OH

Matrix: Water

Collected: 05/06/98 N/A

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total.....	mg/L	9.3	ND	0.50	50	N/A	JWR	05/14/98	09:00	335.4\9010
Cyanide, Amenable to Cl.....	mg/L			0.01	1	N/A	JWR	05/19/98	08:00	335.1
Specific Conductance.....	umho/cm	2400		1.0	1	N/A	MAR	05/11/98	09:55	120.1
Fluoride.....	mg/L	100		2.0	20	N/A	MAR	05/15/98	08:20	340.2
pH .....	S.U.	9.63			1	N/A	SJM	05/07/98	17:35	150.1
Arsenic, Dissolved.....	mg/L	0.036		0.004	1	N/A	JYH	05/08/98	15:37	6010B
Beryllium, Dissolved.....	mg/L	0.0013		0.0005	1	N/A	JYH	05/08/98	15:37	6010B
Manganese, Dissolved.....	mg/L	1.1		0.01	1	N/A	JYH	05/08/98	15:37	6010B
Sodium, Dissolved.....	mg/L	490		10	20	N/A	JYH	05/08/98	15:37	6010B
Vanadium, Dissolved.....	mg/L	0.04		0.01	1	N/A	JYH	05/08/98	15:37	6010B

Product: 826-SPX-VO - Special List - 8260

Lab Sample ID: L9805118-06

Client Sample ID: MW-31

Site/Work ID: HM003.07/ORMET/HANNIBAL, OH

Matrix: Water

Dil. Type: N/A

COC Info: N/A

Sample Weight: N/A

Extract Volume: N/A

Date Collected: 05/06/98

% Solid: N/A

TCPLP Extract Date: N/A

Extract Date: N/A

Analysis Date: 05/14/98 Time: 22:59

Instrument: HPMS8

Analyst: JYH

Lab File ID: 8HY01929

Method: 8260B

Run ID: R46428

CAS #	Compound	Units	Result	Qualifiers	RL	Dilution
127-18-4	Tetrachloroethene.....	ug/L	22		5.0	1
SURROGATES- In Percent Recovery:						
	Dibromofluoromethane.....	107		{ 86 - 118% }		
	1,2-Dichloroethane-d4.....	109		{ 80 - 120% }		
	Toluene-d8.....	102		{ 88 - 110% }		
	p-Bromofluorobenzene.....	110		{ 86 - 115% }		

RL = Reporting Limit

Login #L980118  
May 21, 1998 08:41 am

KEMRON ENVIRONMENTAL SERVICES

Product: 826-SPE-VO - Special List - 8260

Lab Sample ID: L9805118-07

Client Sample ID: TRIP BLANK

Site/Work ID: HM003.07/ORMET/HANNIBAL, OH

Matrix: Water

TCLP Extract Date: N/A

Extract Date: N/A

Analysis Date: 05/14/98 Time: 23:32

Dil. Type: N/A

COC Info: N/A

Date Collected: 05/06/98

Instrument: HPMS8

Analyst: JLH

Lab File ID: 8HY01930

Sample Weight: N/A

Extract Volume: N/A

% Solid: N/A

Method: 8260B

Run ID: R46428

CAS #	Compound	Units	Result	Qualifiers	RL	Dilution
127-18-4	Tetrachloroethene.....	ug/L	ND	ND	5.0	1
SURROGATES- In Percent Recovery:						
	Dibromofluoromethane.....	109		{ 86 - 118% }		
	1,2-Dichloroethane-d4.....	111		{ 80 - 120% }		
	Toluene-d8.....	102		{ 88 - 110% }		
	p-Bromofluorobenzene.....	114		{ 86 - 115% }		

Lab Sample ID: L9805118-08

Client Sample ID: MW-12

Site/Work ID: HM003.07/ORMET/HANNIBAL, OH

Matrix: Water

Collected: 05/06/98 N/A

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total.....	mg/L		ND	0.01	1	N/A	JWR	05/14/98	09:00	335.4\9010
Specific Conductance.....	umho/cm	470		1.0	1	N/A	MAR	05/11/98	09:55	120.1
Fluoride.....	mg/L	0.80		0.10	1	N/A	MAR	05/15/98	08:20	340.2
pH.....	S.U.	7.43			1	N/A	SJM	05/07/98	17:35	150.1
Arsenic, Dissolved.....	mg/L		ND	0.008	2	N/A	JYH	05/08/98	15:42	6010B
Beryllium, Dissolved.....	mg/L		ND	0.0005	1	N/A	JYH	05/08/98	15:42	6010B
Manganese, Dissolved.....	mg/L	1.9		0.01	1	N/A	JYH	05/08/98	15:42	6010B
Sodium, Dissolved.....	mg/L	23		0.50	1	N/A	JYH	05/08/98	15:42	6010B
Vanadium, Dissolved.....	mg/L		ND	0.01	1	N/A	JYH	05/08/98	15:42	6010B

RL = Reporting Limit

Login #L9805118-18  
May 21, 1998 08:41 am

KEMRON ENVIRONMENTAL SERVICES

Lab Sample ID: L9805118-09

Client Sample ID: MW-42S

Site/Work ID: HM003.07/ORMET/HANNIBAL, OH

Matrix: Water

Collected: 05/06/98 N/A

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total	mg/L	0.52		0.02	2	N/A	JWR	05/14/98	09:00	335.4\9010
Cyanide, Amenable to Cl	mg/L		ND	0.01	1	N/A	JWR	05/19/98	08:00	335.1
Specific Conductance	umho/cm	1400		1.0	1	N/A	MAR	05/11/98	09:55	120.1
Fluoride	mg/L	27		0.50	5	N/A	MAR	05/15/98	08:20	340.2
pH	S.U.	8.26			1	N/A	SJM	05/07/98	17:35	150.1
Arsenic, Dissolved	mg/L		ND	0.004	1	N/A	JYH	05/08/98	15:46	6010B
Beryllium, Dissolved	mg/L		ND	0.0005	1	N/A	JYH	05/08/98	15:46	6010B
Manganese, Dissolved	mg/L			0.01	1	N/A	JYH	05/08/98	15:46	6010B
Sodium, Dissolved	mg/L	0.37		0.50	1	N/A	JYH	05/08/98	15:46	6010B
Vanadium, Dissolved	mg/L	270	ND	0.01	1	N/A	JYH	05/08/98	15:46	6010B

Lab Sample ID: L9805118-10

Client Sample ID: MW-42D

Site/Work ID: HM003.07/ORMET/HANNIBAL, OH

Matrix: Water

Collected: 05/06/98 N/A

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total	mg/L	0.07		0.01	1	N/A	JWR	05/14/98	09:00	335.4\9010
Cyanide, Amenable to Cl	mg/L	0.01		0.01	1	N/A	JWR	05/19/98	08:00	335.1
Specific Conductance	umho/cm	550		1.0	1	N/A	MAR	05/11/98	09:55	120.1
Fluoride	mg/L	3.3		0.10	1	N/A	MAR	05/15/98	09:30	340.2
pH	S.U.	7.54			1	N/A	SJM	05/07/98	17:35	150.1
Arsenic, Dissolved	mg/L		ND	0.008	2	N/A	JYH	05/08/98	15:51	6010B
Beryllium, Dissolved	mg/L		ND	0.0005	1	N/A	JYH	05/08/98	15:51	6010B
Manganese, Dissolved	mg/L	1.2		0.01	1	N/A	JYH	05/08/98	15:51	6010B
Sodium, Dissolved	mg/L	26		0.50	1	N/A	JYH	05/08/98	15:51	6010B
Vanadium, Dissolved	mg/L		ND	0.01	1	N/A	JYH	05/08/98	15:51	6010B

RL = Reporting Limit

Login #L9805118  
May 21, 1998 08:41 am

KEMRON ENVIRONMENTAL SERVICES

Lab Sample ID: L9805118-11  
Client Sample ID: MW-16  
Site/Work ID: HM003.07/ORMET/HANNIBAL, OH  
Matrix: Water  
Collected: 05/06/98 N/A  
COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total.....	mg/L	2.0		0.05	5	N/A	JWR	05/14/98	09:00	335.4\9010
Cyanide, Amenable to Cl.....	mg/L	0.40		0.01	1	N/A	JWR	05/19/98	08:00	335.1
Specific Conductance.....	umho/cm	750		1.0	1	N/A	MAR	05/11/98	09:55	120.1
Fluoride.....	mg/L	11		0.50	5	N/A	MAR	05/15/98	09:30	340.2
pH .....	S.U.	7.72			1	N/A	SJM	05/07/98	17:35	150.1
Arsenic, Dissolved.....	mg/L		ND	0.004	1	N/A	JYH	05/08/98	15:55	6010B
Beryllium, Dissolved.....	mg/L		ND	0.0005	1	N/A	JYH	05/08/98	15:55	6010B
Manganese, Dissolved.....	mg/L	1.2		0.01	1	N/A	JYH	05/08/98	15:55	6010B
Sodium, Dissolved.....	mg/L	80		0.50	1	N/A	JYH	05/08/98	15:55	6010B
Vanadium, Dissolved.....	mg/L		ND	0.01	1	N/A	JYH	05/08/98	15:55	6010B

RL = Reporting Limit



Environmental Consulting Services

# CHAIN-OF-CUSTODY RECORD

Project Number	Project Name/Location	Container Description/ Number of Containers						TOTAL									
Sample ID	Date/Time	Sample Code	500 mL Plastic	Dis. As, B, M, N, V	Hug - field filled	250 mL Plastic	(N (total & Available))	250 mL Plastic	N/A	250 mL Plastic	40 mL Glass	40C	pH, Sp, Cond, F	40C	Tetrahydrofuran	HCL	
MW-2	5-6-98	L	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
MW-5			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
MW-5d			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
MW-18			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
MW-30			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
MW-31			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Trip Blank			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
MW-12			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
MW-42s			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
MW-42d			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
MW-16			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Total Number of Containers:																	44

Sample Code: L = Liquid; S = Solid; A = Air

Relinquished by:	Organization:	Date:	Time:	Seal Intact?
Received by:	Organization:	Date:	Time:	Yes No NA
Relinquished by:	Organization:	Date:	Time:	Seal Intact?
Received by:	Organization:	Date:	Time:	Yes No NA

REMARKS:

SKS seal intact  
Cooler Temp 10.0  
C-649

DELIVERY METHOD:

In Person

Common Carrier

Lab Courier

Other

KEMRON Environmental Services  
109 Starlite Park  
Marietta, Ohio 45750  
Phone: (614) 373-4071

Ormet Corporation  
Hydrosystems Management Inc.  
331 S. Main Street, Suite 109  
Washington, PA 15301  
Attention: Bob Fargo

PO Number:  
Account Number: ORMET-086

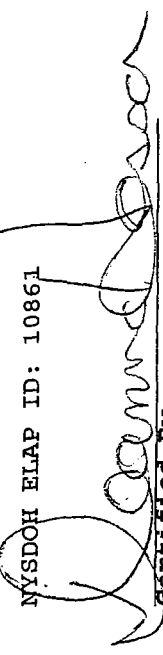
Login #: L9805144  
Report Date: 05/21/98  
Work ID: HM003.07/ORMET/HANNIBAL, OH  
Date Received: 05/07/98

SAMPLE IDENTIFICATION

Sample Number	Sample Description	Sample Number	Sample Description
L9805144-01	MW-34D	L9805144-02	MW-17
L9805144-03	MW-29S	L9805144-04	MW-29D
L9805144-05	FIELD BLANK		

All results on solids/sludges are reported on a dry weight basis, where applicable, unless otherwise specified. This report shall not be reproduced, except in full, without the written approval of KEMRON.

NYSDOH ELAP ID: 10861

  
Certified By  
Deanna Hesson



Login #L9805144  
May 21, 1998 04:53 pm

KEMRON ENVIRONMENTAL SERVICES

Lab Sample ID: L9805144-01

Client Sample ID: MW-34D

Site/Work ID: HM003.07/ORMET/HANNIBAL, OH

Matrix: Water

Collected: 05/07/98 N/A

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total.....	mg/L	0.09		0.01	1	N/A	JWR	05/14/98	09:00	335.4\9010
Cyanide, Amenable to Cl.....	mg/L	0.01		0.01	1	N/A	SJM	05/20/98	14:00	335.1
Specific Conductance.....	umho/cm	590		1.0	1	N/A	MAR	05/11/98	09:55	120.1
Fluoride.....	mg/L	3.9		0.10	1	N/A	MAR	05/15/98	09:30	340.2
pH .....	S.U.	7.37			1	N/A	SJM	05/07/98	14:35	150.1
Arsenic, Dissolved.....	mg/L		ND	0.004	1	N/A	KHA	05/18/98	13:41	6010B
Beryllium, Dissolved.....	mg/L		ND	0.0005	1	N/A	KHA	05/18/98	13:41	6010B
Manganese, Dissolved.....	mg/L	0.68		0.01	1	N/A	KHA	05/18/98	13:41	6010B
Sodium, Dissolved.....	mg/L	35		0.50	1	R-2	JYH	05/18/98	16:05	6010B
Vanadium, Dissolved.....	mg/L		ND	0.01	1	N/A	KHA	05/18/98	13:41	6010B

Lab Sample ID: L9805144-02

Client Sample ID: MW-17

Site/Work ID: HM003.07/ORMET/HANNIBAL, OH

Matrix: Water

Collected: 05/07/98 N/A

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total.....	mg/L	0.72		0.02	2	N/A	JWR	05/14/98	09:00	335.4\9010
Cyanide, Amenable to Cl.....	mg/L	0.09		0.02	2	N/A	SJM	05/20/98	14:00	335.1
Specific Conductance.....	umho/cm	570		1.0	1	N/A	MAR	05/11/98	09:55	120.1
Fluoride.....	mg/L	3.4		0.10	1	N/A	MAR	05/15/98	09:30	340.2
pH .....	S.U.	7.60			1	N/A	SJM	05/07/98	14:35	150.1
Arsenic, Dissolved.....	mg/L		ND	0.004	1	N/A	KHA	05/18/98	13:45	6010B
Beryllium, Dissolved.....	mg/L		ND	0.0005	1	N/A	KHA	05/18/98	13:45	6010B
Manganese, Dissolved.....	mg/L	1.8		0.01	1	N/A	KHA	05/18/98	13:45	6010B
Sodium, Dissolved.....	mg/L	34		0.50	1	R-2	JYH	05/18/98	16:09	6010B
Vanadium, Dissolved.....	mg/L		ND	0.01	1	N/A	KHA	05/18/98	13:45	6010B

RL = Reporting Limit

Login #L9805144  
May 21, 1998 04:53 pm

KEMRON ENVIRONMENTAL SERVICES

Lab Sample ID: L9805144-03

Client Sample ID: MW-29S

Site/Work ID: HM003.07/ORMET/HANNIBAL, OH

Matrix: Water

Collected: 05/07/98 N/A

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total.....	mg/L	0.18		0.01	1	N/A	JWR	05/14/98	09:00	335.4\9010
Cyanide, Amenable to Cl.....	mg/L			0.01	1	N/A	SJM	05/20/98	14:00	335.1
Specific Conductance.....	umho/cm	1700	ND	1.0	1	N/A	MAR	05/11/98	09:55	120.1
Fluoride.....	mg/L	26		0.50	5	N/A	MAR	05/15/98	09:30	340.2
pH .....	S.U.	8.64			1	N/A	SJM	05/07/98	14:35	150.1
Arsenic, Dissolved.....	mg/L		ND	0.004	1	N/A	KHA	05/18/98	13:50	6010B
Beryllium, Dissolved.....	mg/L		ND	0.0005	1	N/A	KHA	05/18/98	13:50	6010B
Manganese, Dissolved.....	mg/L	0.09		0.01	1	N/A	KHA	05/18/98	13:50	6010B
Sodium, Dissolved.....	mg/L	370		0.50	1	R-2	JYH	05/18/98	16:42	6010B
Vanadium, Dissolved.....	mg/L		ND	0.01	1	N/A	KHA	05/18/98	13:50	6010B

Lab Sample ID: L9805144-04

Client Sample ID: MW-29D

Site/Work ID: HM003.07/ORMET/HANNIBAL, OH

Matrix: Water

Collected: 05/07/98 N/A

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total.....	mg/L	0.17		0.01	1	N/A	JWR	05/14/98	09:00	335.4\9010
Cyanide, Amenable to Cl.....	mg/L			0.01	1	N/A	SJM	05/20/98	14:00	335.1
Specific Conductance.....	umho/cm	550	ND	1.0	1	N/A	MAR	05/11/98	09:55	120.1
Fluoride.....	mg/L	3.5		0.10	1	N/A	MAR	05/15/98	09:30	340.2
pH .....	S.U.	7.65			1	N/A	SJM	05/07/98	14:35	150.1
Arsenic, Dissolved.....	mg/L		ND	0.004	1	N/A	KHA	05/18/98	13:54	6010B
Beryllium, Dissolved.....	mg/L		ND	0.0005	1	N/A	KHA	05/18/98	13:54	6010B
Manganese, Dissolved.....	mg/L	1.8		0.01	1	N/A	KHA	05/18/98	13:54	6010B
Sodium, Dissolved.....	mg/L	28		0.50	1	R-2	JYH	05/18/98	16:47	6010B
Vanadium, Dissolved.....	mg/L		ND	0.01	1	N/A	KHA	05/18/98	13:54	6010B

RL = Reporting Limit

Login #L9800044  
May 21, 1998 04:53 pm

KEMRON ENVIRONMENTAL SERVICES

Lab Sample ID: L9805144-05  
Client Sample ID: FIELD BLANK  
Site/Work ID: HM003.07/ORMET/HANNIBAL, OH

Matrix: Water  
Collected: 05/07/98 N/A  
COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total.....	mg/L	0.01	ND	0.01	1	N/A	JWR	05/14/98	09:00	335.4\9010
Specific Conductance.....	umho/cm			1.0	1	N/A	MAR	05/11/98	09:55	120.1
Fluoride.....	mg/L		ND	0.10	1	N/A	MAR	05/15/98	09:30	340.2
pH .....	S.U.	6.31			1	N/A	SJM	05/07/98	14:35	150.1
Arsenic, Dissolved.....	mg/L		ND	0.004	1	N/A	KHA	05/18/98	13:59	6010B
Beryllium, Dissolved.....	mg/L		ND	0.0005	1	N/A	KHA	05/18/98	13:59	6010B
Manganese, Dissolved.....	mg/L		ND	0.01	1	N/A	KHA	05/18/98	13:59	6010B
Sodium, Dissolved.....	mg/L		ND	0.50	1	R-2	JYH	05/18/98	16:51	6010B
Vanadium, Dissolved.....	mg/L		ND	0.01	1	N/A	KHA	05/18/98	13:59	6010B

RL = Reporting Limit



**CHAIN-OF-CUSTODY RECORD**

Project Number	Project Name/Location	Container Description/ Number of Containers										TOTAL
HM003.07	Ormet/Hannibal, Ohio Laboratory Kemton											
Sampling Personnel		J Campbell, S Menosky										
Sample ID	Date/Time	Sample Code	500 mL Plastic	Diox As, Pb, Cu, Ni, V	HMO <sub>3</sub> -field filtered	250 mL Plastic	CN (Total + Amenable)	NADH	250 mL Plastic	pH, sp Cond, F		
<del>HW-34</del>												
MW-34d	5-7-98	L	-	-	-	-	-	-	-	-		3
MW-17			-	-	-	-	-	-	-	-		3
MW-29s			-	-	-	-	-	-	-	-		3
MW-29D			-	-	-	-	-	-	-	-		3
Field Blank			-	-	-	-	-	-	-	-		3
			Total Number of Containers:									
			15									

Sample Code: L = Liquid; S = Solid; A = Air

**Sample Code: L = Liquid; S = Solid; A = Air**

Relinquished by: <i>[Signature]</i>	Organization: <i>HMTL</i>	Date: <i>5-7-98</i>	Time: <i>1200</i>	Seal Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No NA
Received by: <i>[Signature]</i>	Organization: <i>[Blank]</i>	Date: <i>[Blank]</i>	Time: <i>[Blank]</i>	Seal Intact? <input type="checkbox"/> Yes <input type="checkbox"/> No NA
Relinquished by: <i>[Signature]</i>	Organization: <i>KEMRON</i>	Date: <i>7 MAY 98</i>	Time: <i>155</i>	Seal Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No NA
Received by: <i>[Signature]</i>	Organization: <i>[Blank]</i>	Date: <i>7 MAY 98</i>	Time: <i>1515</i>	Seal Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No NA
REMARKS: <i>RVA Total Encl and if detectable results then run Amenable Gm.</i>				
<i>(Dena Supply KEMRON 5/7/98 1315 Spd used intact cooler temp 6.0)</i>				
DELIVERY METHOD: <i>[Blank]</i>	In Person <input type="checkbox"/>	Common Carrier <input type="checkbox"/>	Lab Courier <i>KEMRON</i>	Other <input type="checkbox"/>



APPENDIX B-3

LABORATORY ANALYTICAL REPORT FOR AUGUST/SEPTEMBER 1998  
MONITORING EVENT

KEMRON Environmental Services  
109 Starlite Park  
Marietta, Ohio 45750  
Phone: (740) 373-4071

Ormet Corporation  
Hydrosystems Management Inc.  
331 S. Main Street, Suite 109  
Washington, PA 15301  
Attention: Bob Fargo

PO Number:  
Account Number: ORMET-086

Login #: L9809021  
Report Date: 09/16/98  
Work ID: HM003.08/ORMET/HANNIBAL, OH  
Date Received: 09/01/98

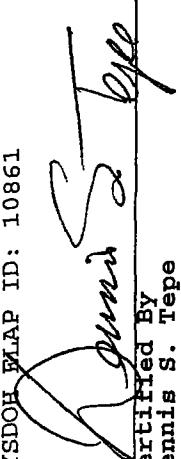
SAMPLE IDENTIFICATION

Sample Number	Sample Description	Sample Number	Sample Description
L9809021-01	MW-2	L9809021-02	MW-5
L9809021-03	MW-12	L9809021-04	MW-16
L9809021-05	MW-18	L9809021-06	MW-28
L9809021-07	MW-28D	L9809021-08	MW-31
L9809021-09	MW-31D	L9809021-10	MW-32
L9809021-11	MW-35	L9809021-12	MW-36
L9809021-13	MW-37	L9809021-14	FIELD BLANK
L9809021-15	TRIP BLANK		

\*\*\*REVISED REPORT\*\*\*

All results on solids/sludges are reported on a dry weight basis, where applicable, unless otherwise specified. This report shall not be reproduced, except in full, without the written approval of KEMRON.

NYSDOH ELAP ID: 10861

  
Certified By  
Dennis S. Tepe

Login #L9800021  
September 16, 1998 09:25 am

KEMRON ENVIRONMENTAL SERVICES

Lab Sample ID: L9809021-01

Client Sample ID: MW-2

Site/Work ID: HM003.08/ORMET/HANNIBAL, OH

Matrix: Water

Collected: 09/01/98 N/A

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total.....	mg/L	21		1.0	100	N/A	SJM	09/04/98	13:00	335.4\9010
Amenable to Cl.....	mg/L	0.30		0.01	1	N/A	SJM	09/09/98	14:00	335.1
Specific Conductance.....	umho/cm	1900		1.0	1	N/A	SLJ	09/04/98	14:30	120.1
Fluoride.....	mg/L	69		1.0	10	N/A	DLN	09/03/98	09:05	340.2
pH .....	S.U.	9.96		1	1	N/A	SLJ	09/02/98	14:57	150.1
Arsenic, Dissolved.....	mg/L	0.086		0.004	1	N/A	ALC	09/08/98	16:44	6010B
Beryllium, Dissolved.....	mg/L	0.00089		0.0005	1	N/A	ALC	09/08/98	16:44	6010B
Manganese, Dissolved.....	mg/L	0.90		0.01	1	N/A	SLP	09/04/98	18:09	6010B
Sodium, Dissolved.....	mg/L	440		0.50	1	N/A	SLP	09/04/98	18:09	6010B
Vanadium, Dissolved.....	mg/L	0.051		0.01	1	R-2	ALC	09/08/98	16:44	6010B

Product: 826-SPE-VO - Special List - 8260

Lab Sample ID: L9809021-01

Client Sample ID: MW-2

Site/Work ID: HM003.08/ORMET/HANNIBAL, OH

Matrix: Water

Dil. Type: N/A

COC Info: N/A

Sample Weight: N/A

Extract Volume: N/A

Date Collected: 09/01/98

% Solid: N/A

TCLP Extract Date: N/A

Extract Date: N/A

Analysis Date: 09/10/98 Time: 20:20

Instrument: HPMS2

Analyst: SLT

Lab File ID: 20R26117

Method: 8260B

Run ID: R52108

CAS #	Compound	Units	Result	Qualifiers	RL	Dilution
127-18-4	Tetrachloroethene.....	ug/L		ND	5.0	1
SURROGATES- In Percent Recovery:						
	Dibromofluoromethane.....	107		( 86 - 118%)		
	1,2-Dichloroethane-d4.....	102		( 80 - 120%)		
	Toluene-d8.....	102		( 88 - 110%)		
	p-Bromofluorobenzene.....	112		( 86 - 115%)		

RL = Reporting Limit



Login #L9809021  
September 16, 1998 09:25 am

KEMRON ENVIRONMENTAL SERVICES

Lab Sample ID: L9809021-02

Client Sample ID: MW-5

Site/Work ID: HM003.08/ORMET/HANNIBAL, OH

Matrix: Water

Collected: 09/01/98 N/A

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total	mg/L	2.0		0.10	10	N/A	SJM	09/04/98	13:00	335.4\9010
Cyanide, Amenable to Cl	mg/L	0.02		0.01	1	N/A	SJM	09/09/98	14:00	335.1
Specific Conductance	umho/cm	1200		1.0	1	N/A	SLJ	09/04/98	14:30	120.1
Fluoride	mg/L	18		0.20	2	N/A	DLN	09/03/98	09:05	340.2
pH	S.U.	8.92			1	N/A	SLJ	09/02/98	14:57	150.1
Arsenic, Dissolved	mg/L	0.0089		0.004	1	N/A	ALC	09/08/98	16:44	6010B
Beryllium, Dissolved	mg/L		ND	0.0005	1	N/A	ALC	09/08/98	16:44	6010B
Manganese, Dissolved	mg/L	0.16		0.01	1	N/A	SLP	09/04/98	18:14	6010B
Sodium, Dissolved	mg/L	240		0.50	1	N/A	SLP	09/04/98	18:14	6010B
Vanadium, Dissolved	mg/L		ND	0.01	1	R-2	ALC	09/08/98	16:44	6010B

Product: 826-SPE-VO - Special List - 8260

Lab Sample ID: L9809021-02

Client Sample ID: MW-5

Site/Work ID: HM003.08/ORMET/HANNIBAL, OH

Matrix: Water

Dil. Type: N/A

COC Info: N/A

Sample Weight: N/A

Extract Volume: N/A

Date Collected: 09/01/98

% Solid: N/A

Instrument: HPMS8

Analyst: SLT

Method: 8260B

Lab File ID: 80R03796

TCLP Extract Date: N/A  
Extract Date: N/A  
Analysis Date: 09/11/98 Time: 14:33

CAS #	Compound	Units	Result	Qualifiers	RL	Dilution
127-18-4	Tetrachloroethene	ug/L		ND	5.0	1
SURROGATES- In Percent Recovery:						
	Dibromofluoromethane	98.8		( 86 - 118% )		
	1,2-Dichloroethane-d4	101		( 80 - 120% )		
	Toluene-d8	107		( 88 - 110% )		
	p-Bromofluorobenzene	107		( 86 - 115% )		

RL = Reporting Limit

Login #L980021  
September 16, 1998 09:25 am

KEMRON ENVIRONMENTAL SERVICES

Lab Sample ID: L9809021-03  
Client Sample ID: MW-12  
Site/Work ID: HM003.08/ORMET/HANNIBAL, OH

Matrix: Water  
Collected: 09/01/98 N/A  
COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total.....	mg/L			0.01	1	N/A	SJM	09/04/98	13:00	335.4\9010
Specific Conductance.....	umho/cm	470	ND	1.0	1	N/A	SLJ	09/04/98	14:30	120.1
Fluoride.....	mg/L	0.92		0.10	1	N/A	DLN	09/03/98	09:05	340.2
pH .....	S.U.	7.57			1	N/A	SLJ	09/02/98	14:57	150.1
Arsenic, Dissolved.....	mg/L		ND	0.004	1	N/A	ALC	09/08/98	16:44	6010B
Beryllium, Dissolved.....	mg/L		ND	0.0005	1	N/A	ALC	09/08/98	16:44	6010B
Manganese, Dissolved.....	mg/L	1.6		0.01	1	N/A	SLP	09/04/98	17:26	6010B
Sodium, Dissolved.....	mg/L	20		0.50	1	N/A	SLP	09/04/98	17:26	6010B
Vanadium, Dissolved.....	mg/L		ND	0.01	1	R-2	ALC	09/08/98	16:44	6010B

Lab Sample ID: L9809021-04  
Client Sample ID: MW-16  
Site/Work ID: HM003.08/ORMET/HANNIBAL, OH

Matrix: Water  
Collected: 09/01/98 N/A  
COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total.....	mg/L	1.4		0.10	10	N/A	SJM	09/04/98	13:00	335.4\9010
Cyanide, Amenable to Cl.....	mg/L	1.4		0.01	1	N/A	SJM	09/09/98	14:00	335.1
Specific Conductance.....	umho/cm	860		1.0	1	N/A	SLJ	09/04/98	14:30	120.1
Fluoride.....	mg/L	9.5		0.10	1	N/A	DLN	09/03/98	09:05	340.2
pH .....	S.U.	7.70			1	N/A	SLJ	09/02/98	14:57	150.1
Arsenic, Dissolved.....	mg/L		ND	0.004	1	N/A	ALC	09/09/98	19:31	6010B
Beryllium, Dissolved.....	mg/L		ND	0.0005	1	N/A	ALC	09/09/98	19:31	6010B
Manganese, Dissolved.....	mg/L	1.3		0.01	1	N/A	SLP	09/04/98	18:19	6010B
Sodium, Dissolved.....	mg/L	75		0.50	1	N/A	SLP	09/04/98	18:19	6010B
Vanadium, Dissolved.....	mg/L		ND	0.01	1	R-2	ALC	09/09/98	19:31	6010B

RL = Reporting Limit

Login #L9805021  
September 16, 1998 09:25 am

KEMRON ENVIRONMENTAL SERVICES

Lab Sample ID: L9809021-05

Client Sample ID: MW-18

Site/Work ID: HM003.08/ORMET/HANNIBAL, OH

Matrix: Water

Collected: 09/01/98 N/A

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total	mg/L	5.9	ND	0.25	25	N/A	SJM	09/04/98	13:00	335.4\9010
Amenable to Cl	mg/L			0.01	1	N/A	SJM	09/09/98	14:00	335.1
Specific Conductance	umho/cm	3600		1.0	1	N/A	SLJ	09/04/98	14:30	120.1
Fluoride	mg/L	210		2.5	25	N/A	DLN	09/03/98	09:05	340.2
pH	S.U.	9.70		1	1	N/A	SLJ	09/02/98	14:57	150.1
Arsenic, Dissolved	mg/L	0.085		0.004	1	N/A	ALC	09/09/98	19:31	6010B
Beryllium, Dissolved	mg/L	0.00084		0.0005	1	N/A	ALC	09/09/98	19:31	6010B
Manganese, Dissolved	mg/L	0.29		0.01	1	N/A	SLP	09/04/98	18:23	6010B
Sodium, Dissolved	mg/L	800		0.50	1	N/A	SLP	09/04/98	18:23	6010B
Vanadium, Dissolved	mg/L	0.022		0.01	1	R-2	ALC	09/09/98	19:31	6010B

Product: 826-SPE-VO - Special List - 8260

Lab Sample ID: L9809021-05

Client Sample ID: MW-18

Site/Work ID: HM003.08/ORMET/HANNIBAL, OH

Matrix: Water

Dil. Type: N/A

COC Info: N/A

Sample Weight: N/A

Extract Volume: N/A

Date Collected: 09/01/98

% Solid: N/A

TCLP Extract Date: N/A

Extract Date: N/A

Analysis Date: 09/11/98 Time: 15:07

Instrument: HPMS8

Analyst: SLT

Lab File ID: 80R03797

Method: 8260B

Run ID: R52227

CAS #	Compound	Units	Result	Qualifiers	RL	Dilution
127-18-4	Tetrachloroethene	ug/L	14		5.0	1
SURROGATES- In Percent Recovery:						
	Dibromofluoromethane	98.2		( 86 - 118%)		
	1,2-Dichloroethane-d4	102		( 80 - 120%)		
	Toluene-d8	107		( 88 - 110%)		
	p-Bromofluorobenzene	108		( 86 - 115%)		

RL = Reporting Limit

Login #L9809021  
September 16, 1998 09:25 am

KEMRON ENVIRONMENTAL SERVICES

Lab Sample ID: L9809021-06  
Client Sample ID: MW-28  
Site/Work ID: HM003.08/ORMET/HANNIBAL, OH

Matrix: Water  
Collected: 09/01/98 N/A  
COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total.....	mg/L	0.11		0.01	1	N/A	SJM	09/04/98	13:00	335.4\9010
Cyanide, Amenable to Cl.....	mg/L	0.11		0.01	1	N/A	SJM	09/09/98	14:00	335.1
Specific Conductance.....	umho/cm	540		1.0	1	N/A	SLJ	09/04/98	14:30	120.1
Fluoride.....	mg/L	0.27		0.10	1	N/A	DLN	09/03/98	09:05	340.2
pH .....	S.U.	5.81			1	N/A	SLJ	09/02/98	14:57	150.1
Arsenic, Dissolved.....	mg/L		ND	0.004	1	N/A	ALC	09/09/98	19:31	6010B
Beryllium, Dissolved.....	mg/L		ND	0.0005	1	N/A	ALC	09/09/98	19:31	6010B
Manganese, Dissolved.....	mg/L	0.011		0.01	1	N/A	SLP	09/04/98	18:28	6010B
Sodium, Dissolved.....	mg/L	64		0.50	1	N/A	SLP	09/04/98	18:28	6010B
Vanadium, Dissolved.....	mg/L		ND	0.01	1	R-2	ALC	09/09/98	19:31	6010B

Lab Sample ID: L9809021-07  
Client Sample ID: MW-28D  
Site/Work ID: HM003.08/ORMET/HANNIBAL, OH

Matrix: Water  
Collected: 09/01/98 N/A  
COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total.....	mg/L	0.11		0.01	1	N/A	SJM	09/04/98	13:00	335.4\9010
Cyanide, Amenable to Cl.....	mg/L	0.11		0.01	1	N/A	SJM	09/09/98	14:00	335.1
Specific Conductance.....	umho/cm	540		1.0	1	N/A	SLJ	09/04/98	14:30	120.1
Fluoride.....	mg/L	0.24		0.10	1	N/A	DLN	09/03/98	09:05	340.2
pH .....	S.U.	5.83			1	N/A	SLJ	09/02/98	14:57	150.1
Arsenic, Dissolved.....	mg/L		ND	0.004	1	N/A	ALC	09/09/98	19:31	6010B
Beryllium, Dissolved.....	mg/L		ND	0.0005	1	N/A	ALC	09/09/98	19:31	6010B
Manganese, Dissolved.....	mg/L	0.01		0.01	1	N/A	SLP	09/04/98	18:33	6010B
Sodium, Dissolved.....	mg/L	65		0.50	1	N/A	SLP	09/04/98	18:33	6010B
Vanadium, Dissolved.....	mg/L		ND	0.01	1	R-2	ALC	09/09/98	19:31	6010B

RL = Reporting Limit

Login #L9809021  
September 16, 1998 09:25 am

KEMRON ENVIRONMENTAL SERVICES

Lab Sample ID: L9809021-08  
Client Sample ID: MW-31  
Site/Work ID: HM003.08/ORMET/HANNIBAL, OH

Matrix: Water  
Collected: 09/01/98 N/A  
COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total.....	mg/L	9.8		0.50	50	N/A	SJM	09/04/98	13:00	335.4\9010
Cyanide, Amenable to Cl.....	mg/L		ND	0.01	1	N/A	SJM	09/09/98	14:00	335.1
Specific Conductance.....	umho/cm	2600		1.0	1	N/A	SLJ	09/04/98	14:30	120.1
Fluoride.....	mg/L	120		2.5	25	N/A	DLN	09/03/98	09:05	340.2
pH .....	S.U.	9.67		1	1	N/A	SLJ	09/02/98	14:57	150.1
Arsenic, Dissolved.....	mg/L	0.044		0.004	1	N/A	KHA	09/11/98	09:45	6010B
Beryllium, Dissolved.....	mg/L	0.0014		0.0005	1	N/A	KHA	09/11/98	09:45	6010B
Manganese, Dissolved.....	mg/L	1.1		0.01	1	N/A	SLP	09/04/98	18:38	6010B
Sodium, Dissolved.....	mg/L	620		0.50	1	N/A	SLP	09/04/98	18:38	6010B
Vanadium, Dissolved.....	mg/L	0.045		0.01	1	R-2	KHA	09/11/98	09:45	6010B

Product: 826-SPE-VO - Special List - 8260

Lab Sample ID: L9809021-08  
Client Sample ID: MW-31  
Site/Work ID: HM003.08/ORMET/HANNIBAL, OH  
Matrix: Water

Dil. Type: N/A  
COC Info: N/A  
Sample Weight: N/A  
Extract Volume: N/A

Date Collected: 09/01/98

TCLP Extract Date: N/A  
Extract Date: N/A  
Analysis Date: 09/11/98 Time: 15:40  
Instrument: HPMS8  
Analyst: SLT  
Lab File ID: 80R03798  
% Solid: N/A  
Method: 8260B  
Run ID: R52227

CAS #	Compound	Units	Result	Qualifiers	RL	Dilution
127-18-4	Tetrachloroethene.....	ug/L	17		5.0	1
SURROGATES- In Percent Recovery:						
	Dibromofluoromethane.....		99.9	( 86 - 118%)		
	1,2-Dichloroethane-d4.....		102	( 80 - 120%)		
	Toluene-d8.....		107	( 88 - 110%)		
	p-Bromofluorobenzene.....		107	( 86 - 115%)		

RL = Reporting Limit

Login #L980021  
September 16, 1998 09:25 am

KEMRON ENVIRONMENTAL SERVICES

Lab Sample ID: L9809021-09  
Client Sample ID: MW-31D  
Site/Work ID: HM003.08/ORMET/HANNIBAL, OH

Matrix: Water  
Collected: 09/01/98 N/A  
COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total.....	mg/L	9.5		0.50	50	N/A	SJM	09/04/98	13:00	335.4\9010
Cyanide, Amenable to Cl.....	mg/L		ND	0.01	1	N/A	SJM	09/09/98	14:00	335.1
Specific Conductance.....	umho/cm	2700		1.0	1	N/A	SLJ	09/04/98	14:30	120.1
Fluoride.....	mg/L	130		2.5	25	N/A	DLN	09/03/98	09:05	340.2
pH .....	S.U.	9.67		1	1	N/A	SLJ	09/02/98	14:57	150.1
Arsenic, Dissolved.....	mg/L	0.045		0.004	1	N/A	KHA	09/11/98	09:49	6010B
Beryllium, Dissolved.....	mg/L	0.0013		0.0005	1	N/A	KHA	09/11/98	09:49	6010B
Manganese, Dissolved.....	mg/L	1.1		0.01	1	N/A	SLP	09/04/98	18:43	6010B
Sodium, Dissolved.....	mg/L	600		0.50	1	N/A	SLP	09/04/98	18:43	6010B
Vanadium, Dissolved.....	mg/L	0.043		0.01	1	R-2	KHA	09/11/98	09:49	6010B

Product: 826-SPE-VO - Special List - 8260

Lab Sample ID: L9809021-09  
Client Sample ID: MW-31D  
Site/Work ID: HM003.08/ORMET/HANNIBAL, OH  
Matrix: Water

Dil. Type: N/A  
COC Info: N/A  
Sample Weight: N/A  
Extract Volume: N/A

Date Collected: 09/01/98  
Instrument: HPMS8  
Analyst: SLT  
Lab File ID: 80R03799

TCLP Extract Date: N/A  
Extract Date: N/A  
Analysis Date: 09/11/98 Time: 16:14

% Solid: N/A  
Method: 8260B  
Run ID: R52227

CAS #	Compound	Units	Result	Qualifiers	RL	Dilution
127-18-4	Tetrachloroethene.....	ug/L	20		5.0	1
SURROGATES- In Percent Recovery:						
	Dibromofluoromethane.....	100		( 86 - 118%)		
	1,2-Dichloroethane-d4.....	103		( 80 - 120%)		
	Toluene-d8.....	107		( 88 - 110%)		
	p-Bromofluorobenzene.....	108		( 86 - 115%)		

RL = Reporting Limit

Login #L980-021  
September 16, 1998 09:25 am

KEMRON ENVIRONMENTAL SERVICES

Lab Sample ID: L9809021-10

Client Sample ID: MW-32

Site/Work ID: HM003.08/ORMET/HANNIBAL, OH

Matrix: Water

Collected: 09/01/98 N/A

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total.....	mg/L	4.5		0.25	25	N/A	SJM	09/04/98	13:00	335.4\9010
Cyanide, Amenable to Cl.....	mg/L	1.0		0.01	1	N/A	SJM	09/09/98	14:00	335.1
Specific Conductance.....	umho/cm	760		1.0	1	N/A	SLJ	09/04/98	14:30	120.1
Fluoride.....	mg/L	13		0.20	2	N/A	DLN	09/03/98	09:05	340.2
pH .....	S.U.	8.30			1	N/A	SLJ	09/02/98	14:57	150.1
Arsenic, Dissolved.....	mg/L		ND	0.004	1	N/A	KHA	09/11/98	09:54	6010B
Beryllium, Dissolved.....	mg/L		ND	0.0005	1	N/A	KHA	09/11/98	09:54	6010B
Manganese, Dissolved.....	mg/L	1.8		0.01	1	N/A	SLP	09/04/98	18:47	6010B
Sodium, Dissolved.....	mg/L	78		0.50	1	N/A	SLP	09/04/98	18:47	6010B
Vanadium, Dissolved.....	mg/L		ND	0.01	1	R-2	KHA	09/11/98	09:54	6010B

Lab Sample ID: L9809021-11

Client Sample ID: MW-35

Site/Work ID: HM003.08/ORMET/HANNIBAL, OH

Matrix: Water

Collected: 08/31/98 N/A

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total.....	mg/L	16		1.0	100	N/A	SJM	09/04/98	13:00	335.4\9010
Cyanide, Amenable to Cl.....	mg/L	0.99		0.01	1	N/A	SJM	09/09/98	14:00	335.1
Specific Conductance.....	umho/cm	550		1.0	1	N/A	SLJ	09/04/98	14:30	120.1
Fluoride.....	mg/L	26		0.50	5	N/A	DLN	09/03/98	09:05	340.2
pH .....	S.U.	8.97			1	N/A	SLJ	09/02/98	14:57	150.1
Arsenic, Dissolved.....	mg/L			0.004	1	N/A	KHA	09/11/98	09:58	6010B
Beryllium, Dissolved.....	mg/L		ND	0.0005	1	N/A	KHA	09/11/98	09:58	6010B
Manganese, Dissolved.....	mg/L	0.88		0.01	1	N/A	SLP	09/04/98	18:52	6010B
Sodium, Dissolved.....	mg/L	130		0.50	1	N/A	SLP	09/04/98	18:52	6010B
Vanadium, Dissolved.....	mg/L		ND	0.01	1	R-2	KHA	09/11/98	09:58	6010B

RL = Reporting Limit

Login #L9809021  
September 16, 1998 09:25 am

KEMRON ENVIRONMENTAL SERVICES

Lab Sample ID: L9809021-12

Client Sample ID: MW-36

Site/Work ID: HM003.08/ORMET/HANNIBAL, OH

Matrix: Water

Collected: 09/01/98 N/A

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total.....	mg/L	6.5		0.25	25	N/A	SJM	09/04/98	13:00	335.4\9010
Cyanide, Amenable to Cl.....	mg/L	0.03		0.01	1	N/A	SJM	09/09/98	14:00	335.1
Specific Conductance.....	umho/cm	4500		1.0	1	N/A	SLJ	09/04/98	14:30	120.1
Fluoride.....	mg/L	230		5.0	50	N/A	DLN	09/03/98	09:05	340.2
pH .....	S.U.	9.90		1	1	N/A	SLJ	09/02/98	14:57	150.1
Arsenic, Dissolved.....	mg/L	0.11		0.004	1	N/A	KHA	09/11/98	10:03	6010B
Beryllium, Dissolved.....	mg/L	0.0036		0.0005	1	N/A	KHA	09/11/98	10:03	6010B
Manganese, Dissolved.....	mg/L	1.4		0.01	1	N/A	SLP	09/04/98	19:23	6010B
Sodium, Dissolved.....	mg/L	990		0.50	1	N/A	SLP	09/04/98	19:23	6010B
Vanadium, Dissolved.....	mg/L	0.074		0.01	1	R-2	KHA	09/11/98	10:03	6010B

Lab Sample ID: L9809021-13

Client Sample ID: MW-37

Site/Work ID: HM003.08/ORMET/HANNIBAL, OH

Matrix: Water

Collected: 08/31/98 N/A

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total.....	mg/L	15		1.0	100	N/A	SJM	09/04/98	13:00	335.4\9010
Cyanide, Amenable to Cl.....	mg/L	5.5		0.01	1	N/A	SJM	09/09/98	14:00	335.1
Specific Conductance.....	umho/cm	670		1.0	1	N/A	SLJ	09/04/98	14:30	120.1
Fluoride.....	mg/L	52		1.0	10	N/A	DLN	09/03/98	09:05	340.2
pH .....	S.U.	8.90		1	1	N/A	SLJ	09/02/98	14:57	150.1
Arsenic, Dissolved.....	mg/L	0.02		0.004	1	N/A	KHA	09/11/98	10:08	6010B
Beryllium, Dissolved.....	mg/L	ND		0.0005	1	N/A	KHA	09/11/98	10:08	6010B
Manganese, Dissolved.....	mg/L	0.53		0.01	1	N/A	SLP	09/04/98	19:27	6010B
Sodium, Dissolved.....	mg/L	140		0.50	1	N/A	SLP	09/04/98	19:27	6010B
Vanadium, Dissolved.....	mg/L	0.017		0.01	1	R-2	KHA	09/11/98	10:08	6010B

RL = Reporting Limit



Login #L9809021  
September 16, 1998 09:25 am

KEMRON ENVIRONMENTAL SERVICES

Lab Sample ID: L9809021-14  
Client Sample ID: FIELD BLANK  
Site/Work ID: HM003.08/ORMET/HANNIBAL, OH

Matrix: Water  
Collected: 09/01/98 N/A  
COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total.....	mg/L		ND	0.01	1	N/A	SJM	09/04/98	13:00	335.4\9010
Specific Conductance.....	umho/cm		ND	1.0	1	N/A	SLJ	09/04/98	14:30	120.1
Fluoride.....	mg/L		ND	0.10	1	N/A	DLN	09/03/98	09:05	340.2
pH .....	S.U.	5.55			1	N/A	SLJ	09/02/98	14:57	150.1
Arsenic, Dissolved.....	mg/L		ND	0.004	1	N/A	KHA	09/11/98	10:12	6010B
Beryllium, Dissolved.....	mg/L		ND	0.0005	1	N/A	KHA	09/11/98	10:12	6010B
Manganese, Dissolved.....	mg/L		ND	0.01	1	N/A	SLP	09/04/98	19:32	6010B
Sodium, Dissolved.....	mg/L		ND	0.50	1	N/A	SLP	09/04/98	19:32	6010B
Vanadium, Dissolved.....	mg/L		ND	0.01	1	R-2	KHA	09/11/98	10:12	6010B

Product: 826-SPE-VO - Special List - 8260

Lab Sample ID: L9809021-14  
Client Sample ID: FIELD BLANK  
Site/Work ID: HM003.08/ORMET/HANNIBAL, OH  
Matrix: Water

Dil. Type: N/A  
COC Info: N/A  
Sample Weight: N/A  
Extract Volume: N/A

Date Collected: 09/01/98

Instrument: HPMS8  
Analyst: SLT  
Lab File ID: 80R03800  
% Solid: N/A  
Method: 8260B  
Run ID: R52227

TCLP Extract Date: N/A  
Extract Date: N/A  
Analysis Date: 09/11/98 Time: 16:47

CAS #	Compound	Units	Result	Qualifiers	RL	Dilution
127-18-4	Tetrachloroethene.....	ug/L		ND	5.0	1
SURROGATES- In Percent Recovery:						
	Dibromofluoromethane.....	99.5		( 86 - 118%)		
	1,2-Dichloroethane-d4.....	104		( 80 - 120%)		
	Toluene-d8.....	107		( 88 - 110%)		
	p-Bromofluorobenzene.....	107		( 86 - 115%)		

RL = Reporting Limit

Login #L9800021  
September 16, 1998 09:25 am

KEMRON ENVIRONMENTAL SERVICES

Product: 826-SPE-VO - Special List - 8260

Lab Sample ID: L9809021-15  
Client Sample ID: TRIP BLANK  
Site/Work ID: HM003.08/ORMET/HANNIBAL, OH  
Matrix: Water

Dil. Type: N/A  
COC Info: N/A

Sample Weight: N/A  
Extract Volume: N/A

Date Collected: 09/01/98

% Solid: N/A

TCLP Extract Date: N/A  
Extract Date: N/A

Instrument: HPMS8  
Analyst: SLT

Method: 8260B  
Run ID: R52227

Analysis Date: 09/11/98 Time: 17:21

Lab File ID: 8OR03801

CAS #	Compound	Units	Result	Qualifiers	RL	Dilution
127-18-4	Tetrachloroethene.....	ug/L		ND	5.0	1
SURROGATES- In Percent Recovery:						
	Dibromofluoromethane.....	101		( 86 - 118%)		
	1,2-Dichloroethane-d4.....	105		( 80 - 120%)		
	Toluene-d8.....	107		( 88 - 110%)		
	p-Bromofluorobenzene.....	108		( 86 - 115%)		



Environmental Consulting Services

Page 1 of 1

# CHAIN-OF-CUSTODY RECORD

Project Number	Project Name/Location	Container Description/ Number of Containers						
Sample ID	Date/Time	Sample Code	Container Description/ Number of Containers					TOTAL
			40 mL Glass	40 mL Glass	850 mL Plastic	850 mL Plastic	850 mL Plastic	
Trip Blank	9/11/98	L	2					2
MW-2			2	1	1	1		5
MW-5			2	1	1	1		5
MW-12				1	1	1		3
MW-16				1	1	1		3
MW-18			2	1	1	1		5
MW-28				1	1	1		3
MW-28D			2	1	1	1		5
MW-31			2	1	1	1		5
MW-31D			2	1	1	1		5
MW-32				1	1	1		3
MW-35	8/31/98			1	1	1		3
MW-36	9/1/98			1	1	1		3
MW-37	8/31/98			1	1	1		3
FIELD BLANK	9/1/98		2	1	1	1		5
Total Number of Containers:								56

Sample Code: L = Liquid; S = Solid; A = Air

Relinquished by:	Organization:	Date:	Time:	Seal Intact?
Received by:	Organization:	Date:	Time:	Yes No NA
Relinquished by:	Organization:	Date:	Time:	Seal Intact?
Received by:	Organization:	Date:	Time:	Yes No NA

REMARKS: Only run amenable cyanide if total cyanide is present in each sample. SXS and intact cooler temperature 4.0

DELIVERY METHOD: In Person Common Carrier Lab Courier Other



## APPENDIX C

### DATA VALIDATION SUMMARY REPORT FOR 1998 MONITORING EVENTS

**Data Validation Summary Report  
1998 Remedial Action Ground-Water Monitoring**

**Ormet Corporation  
Hannibal, Ohio**

Under the Remedial Action Ground-Water Monitoring Plan (Revision 1 - April 28, 1997), ground-water samples were collected in May and September at the Ormet Corporation site near Hannibal, Ohio. The samples were analyzed by Kemron Environmental Services of Marietta, Ohio using SW-846 and EPA protocols. Validation of the analytical results was performed by applying principles and concepts of the USEPA National Functional Guidelines. The validation process included a review of sample holding times, blank results, initial and continuing calibrations, surrogate and matrix spike recoveries, and laboratory control sample results. Based on the validation review, no data qualifiers were determined to be warranted for the results from the May and September ground-water monitoring events.

98-SAMP.DV



## APPENDIX D

### CONCENTRATION VS. TIME GRAPHS FOR REMEDIAL ACTION MONITORING PARAMETERS

Appendix D-1 Cyanide Amenable to Chlorination

Appendix D-2 Fluoride

Appendix D-3 Arsenic

Appendix D-4 Beryllium

Appendix D-5 Manganese

Appendix D-6 Vanadium

Appendix D-7 Tetrachloroethene

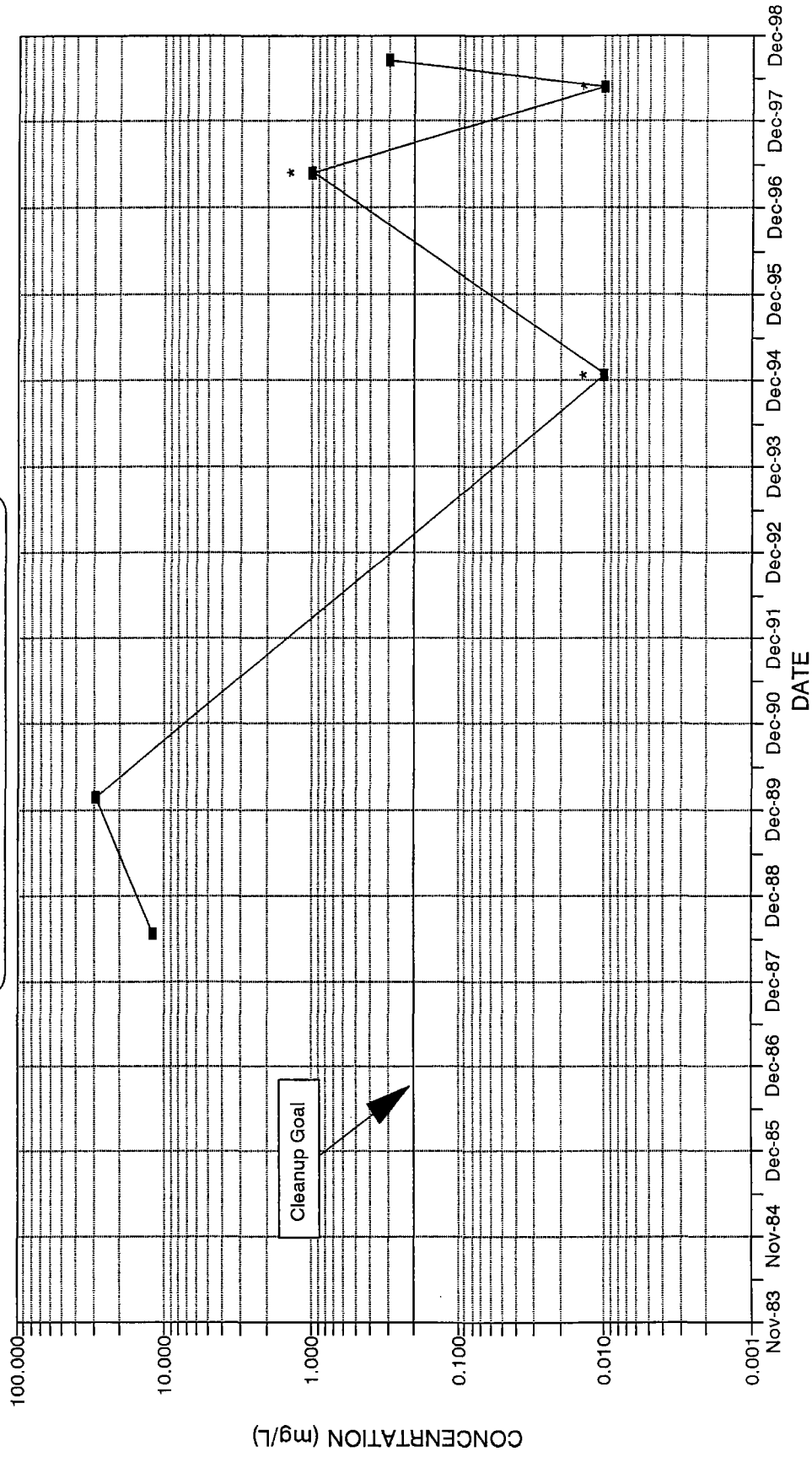
Appendix D-8 Sodium



APPENDIX D-1

CYANIDE AMENABLE TO CHLORINATION

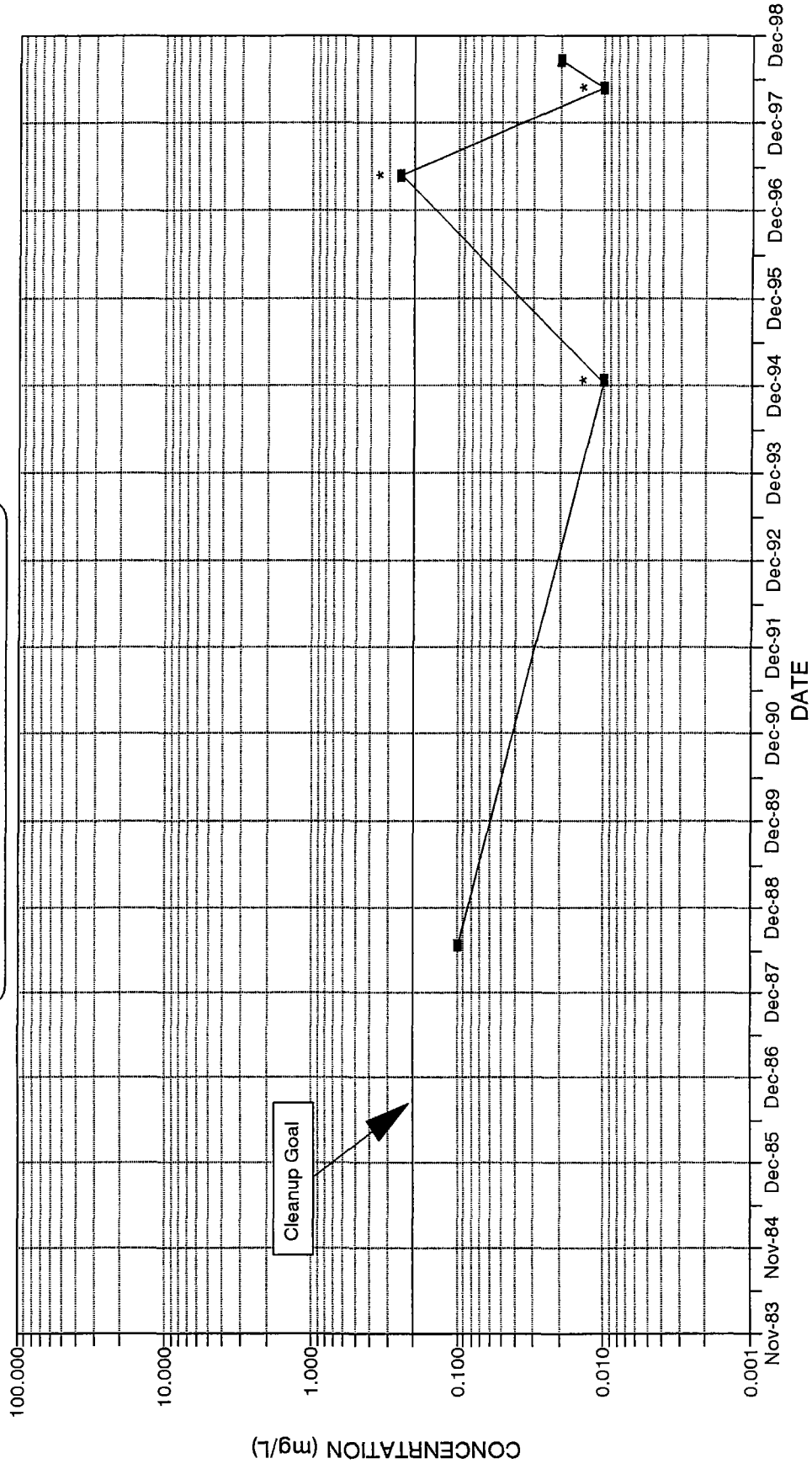
# AMENABLE CYANIDE VS. TIME MW-2



\* = Value plotted is detection limit

■ MW-2

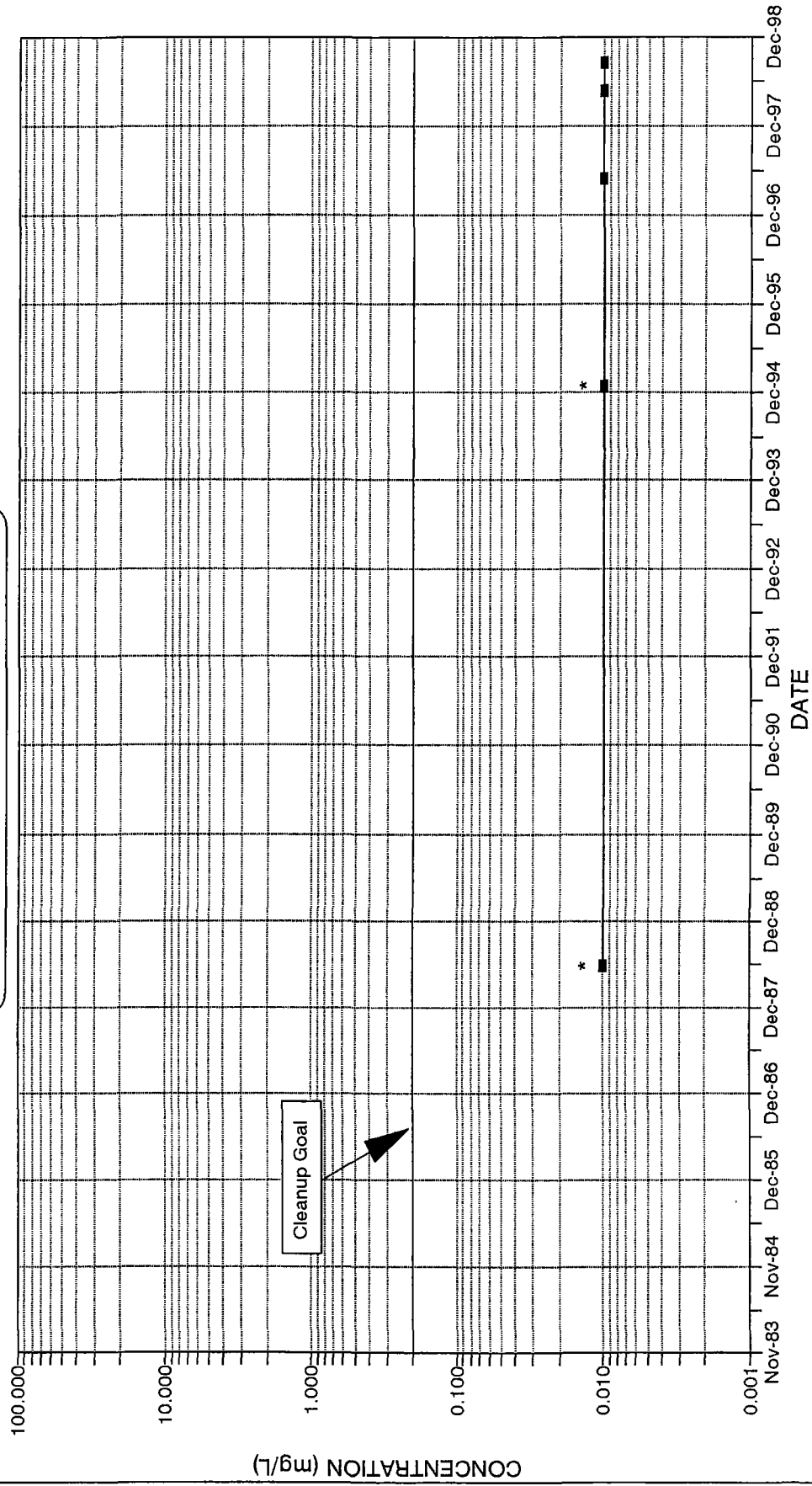
AMENABLE CYANIDE VS. TIME  
MW-5



\* = Value plotted is detection limit

■ MW-5

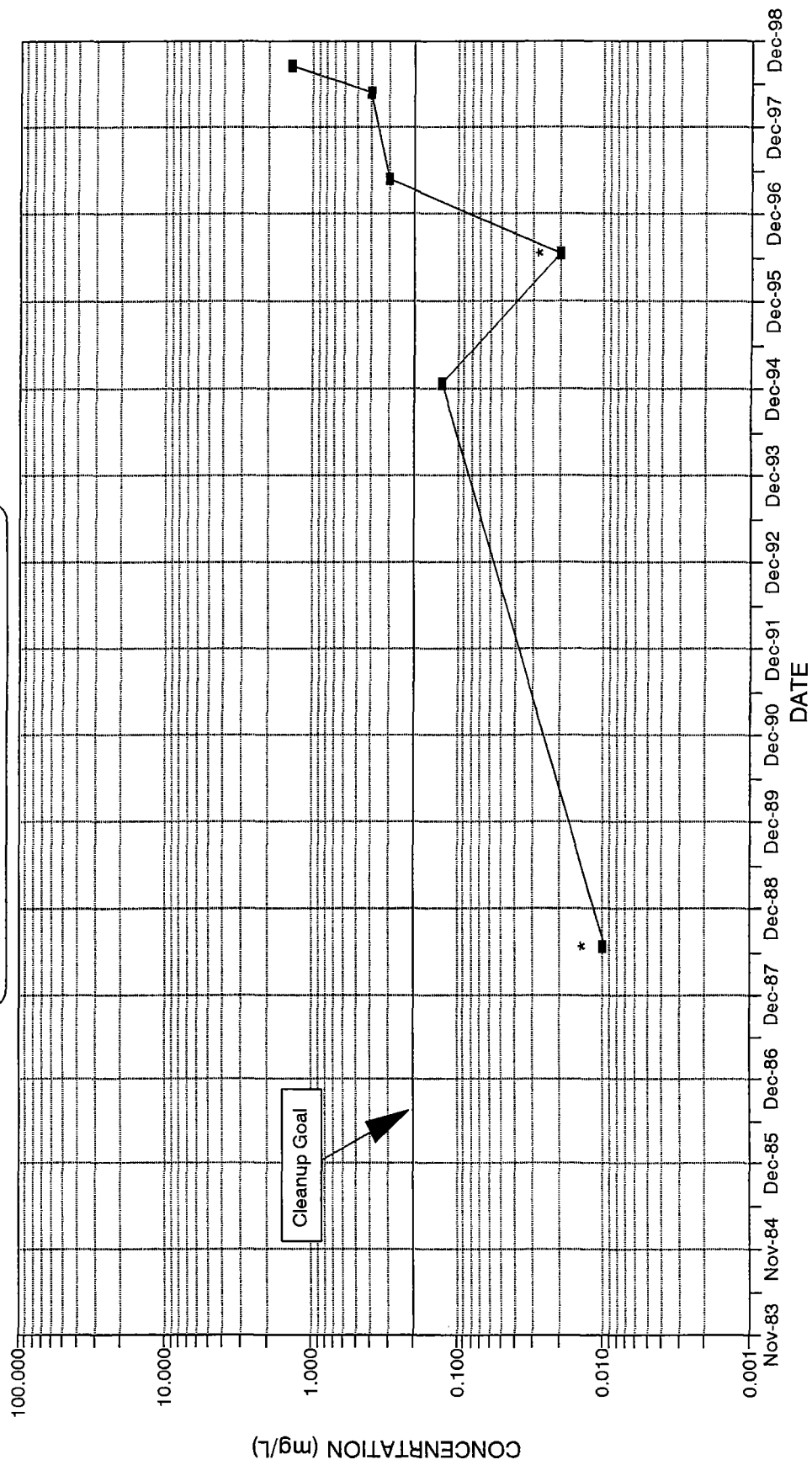
# AMENABLE CYANIDE VS. TIME MW-12



\* = Value plotted is detection limit

■ MW-12

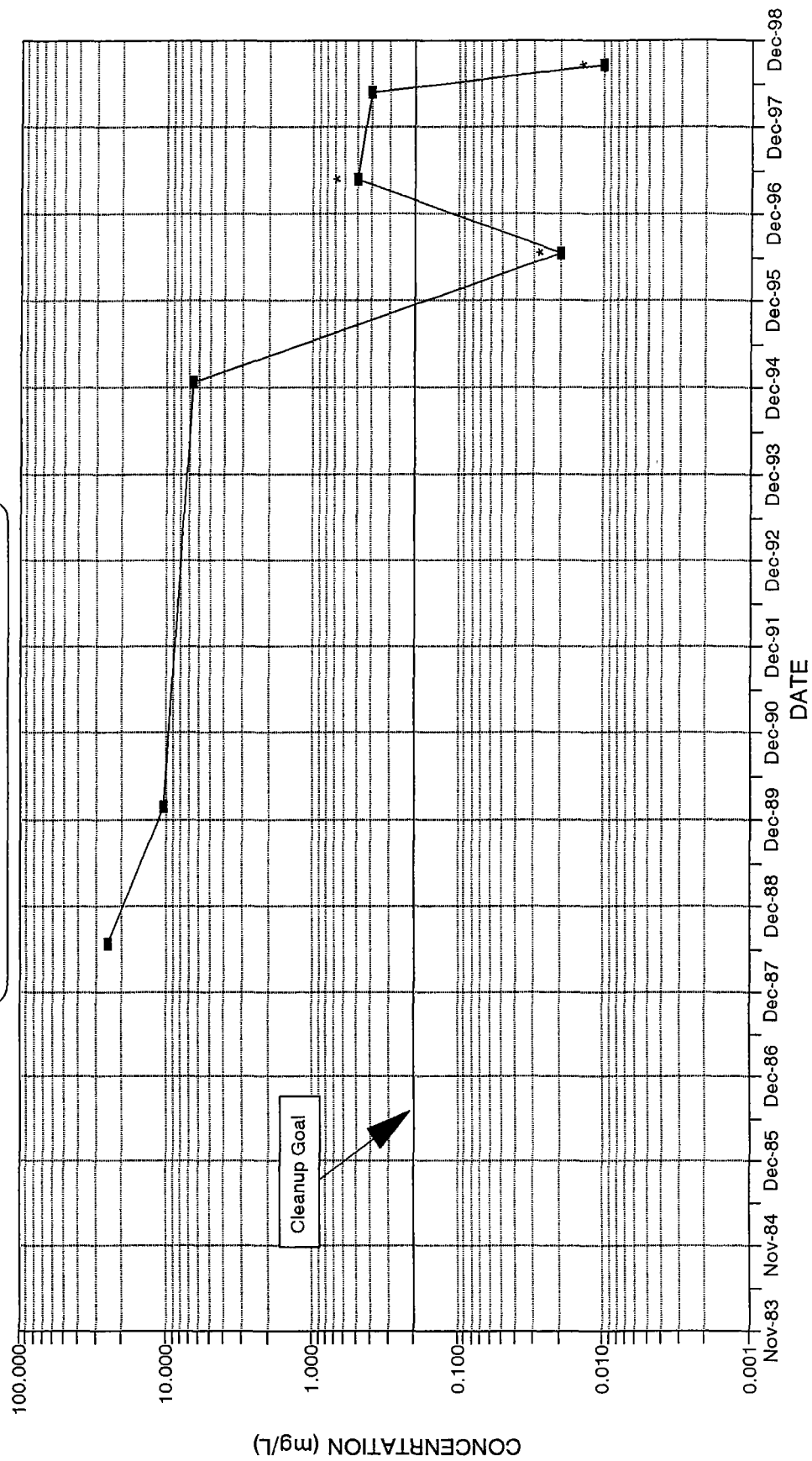
AMENABLE CYANIDE VS. TIME  
MW-16



\* = Value plotted is detection limit

■ MW-16

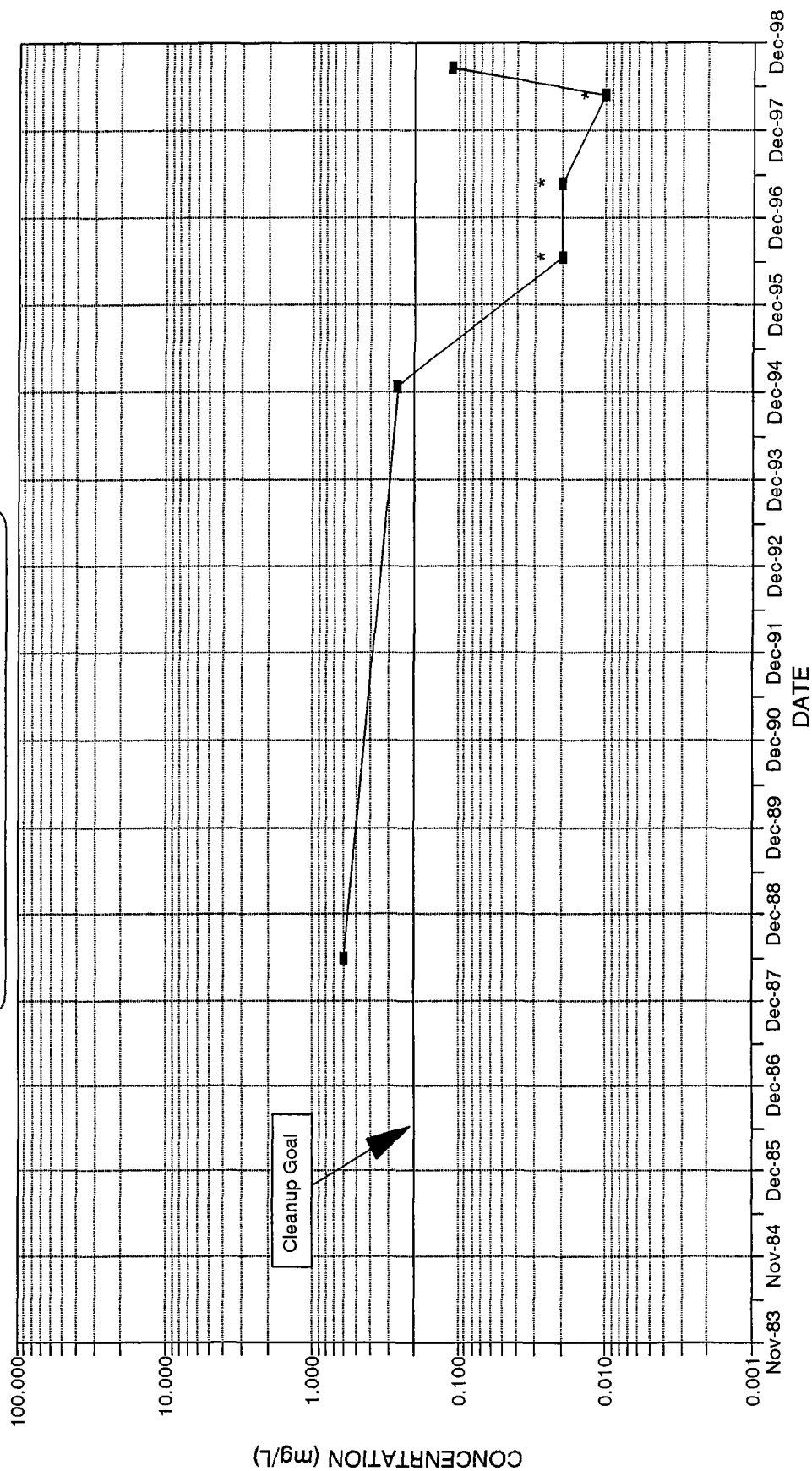
AMENABLE CYANIDE VS. TIME  
MW-18



\* = Value plotted is detection limit

■ MW-18

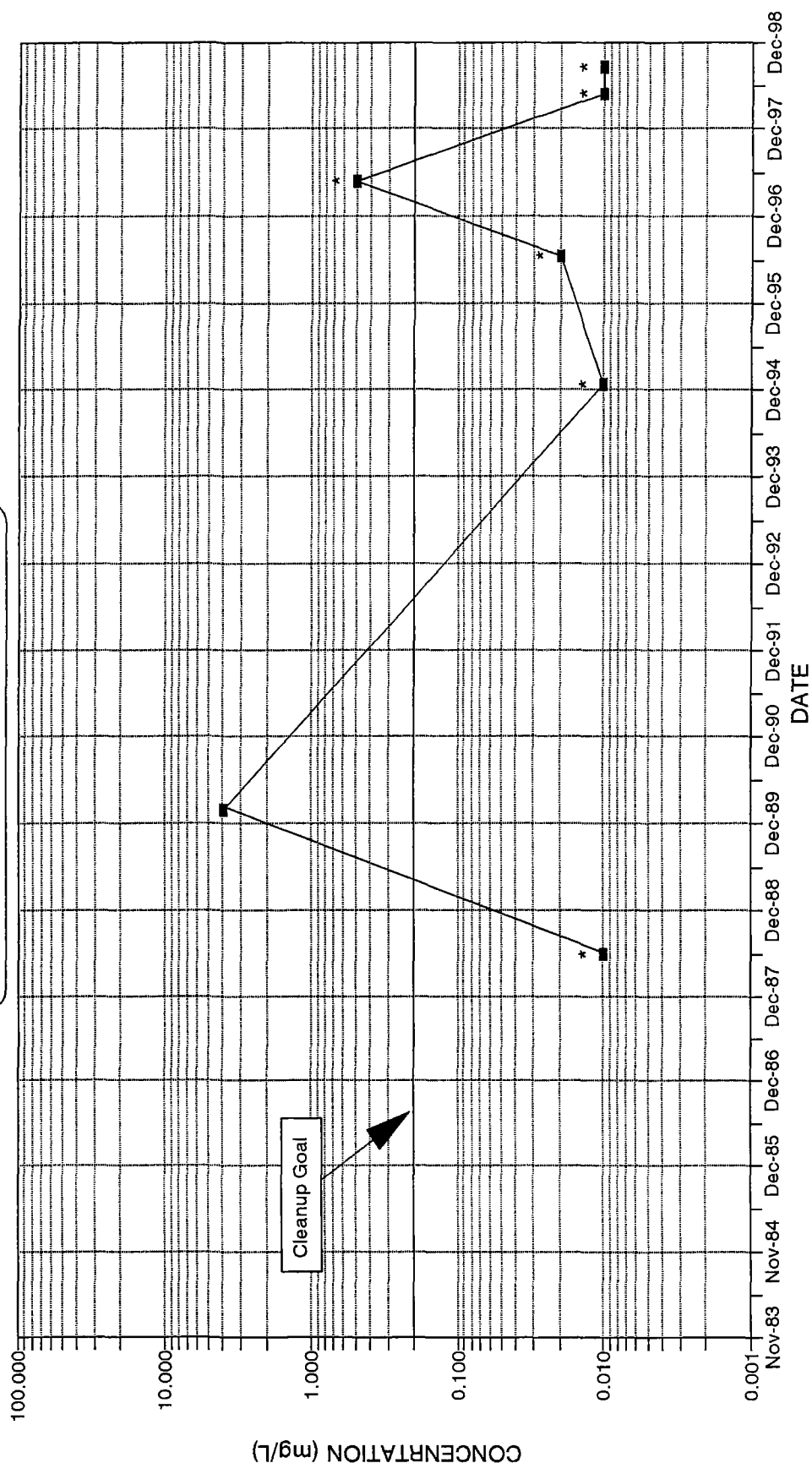
AMENABLE CYANIDE VS. TIME  
MW-28



\* = Value plotted is detection limit

■ MW-28

AMENABLE CYANIDE VS. TIME  
MW-31

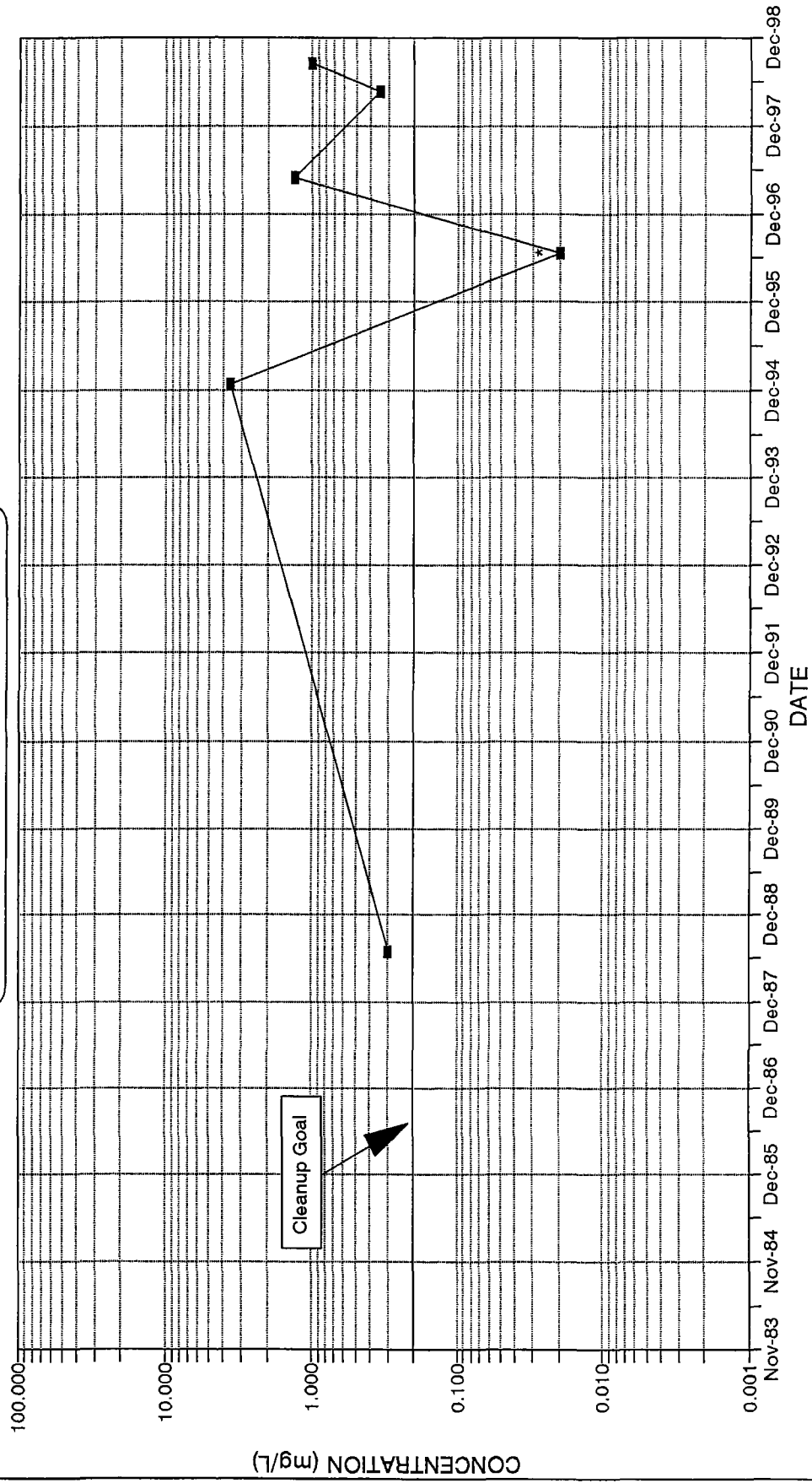


\* = Value plotted is detection limit

■ - MW-31



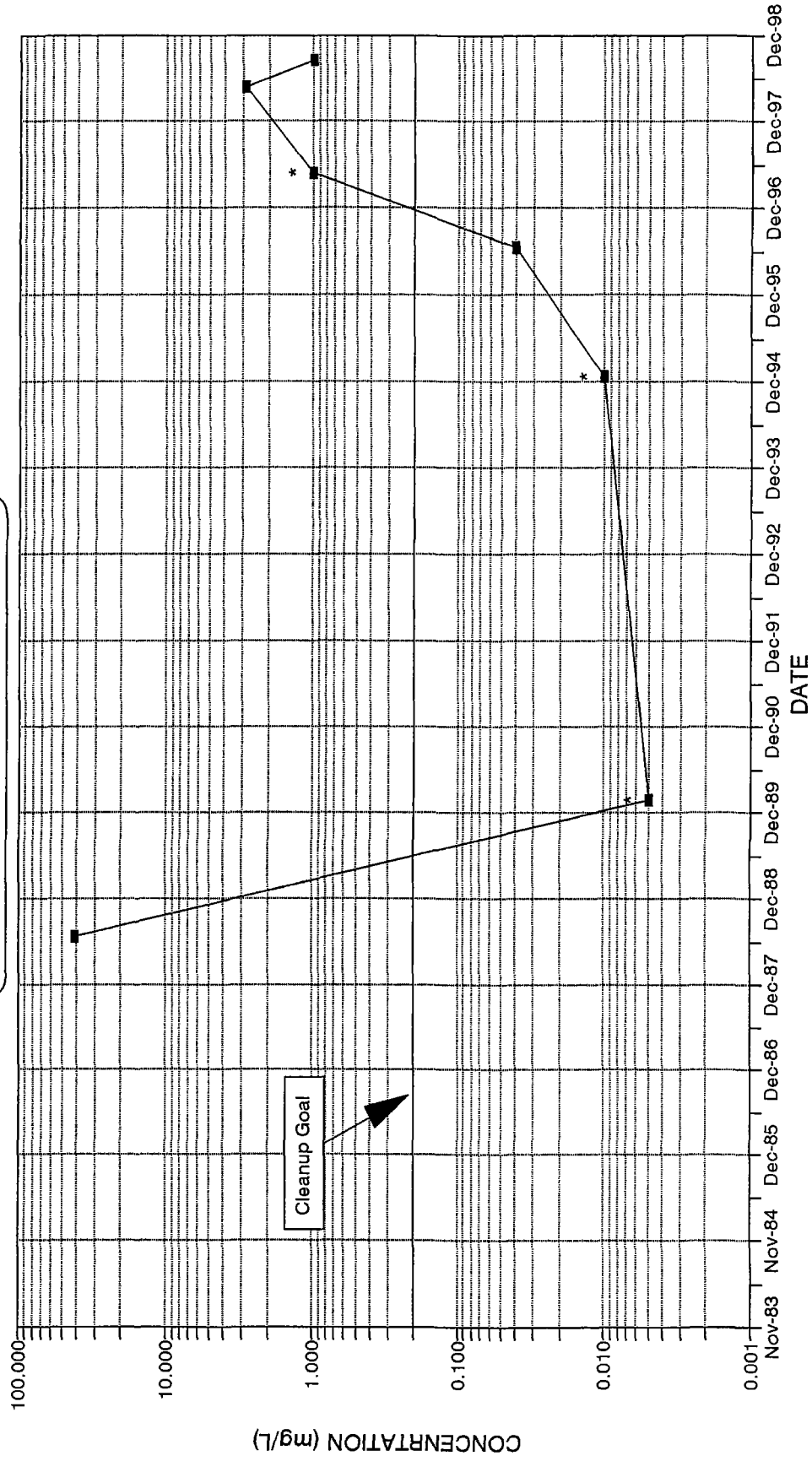
AMENABLE CYANIDE VS. TIME  
MW-32



\* = Value plotted is detection limit

■ - MW-32

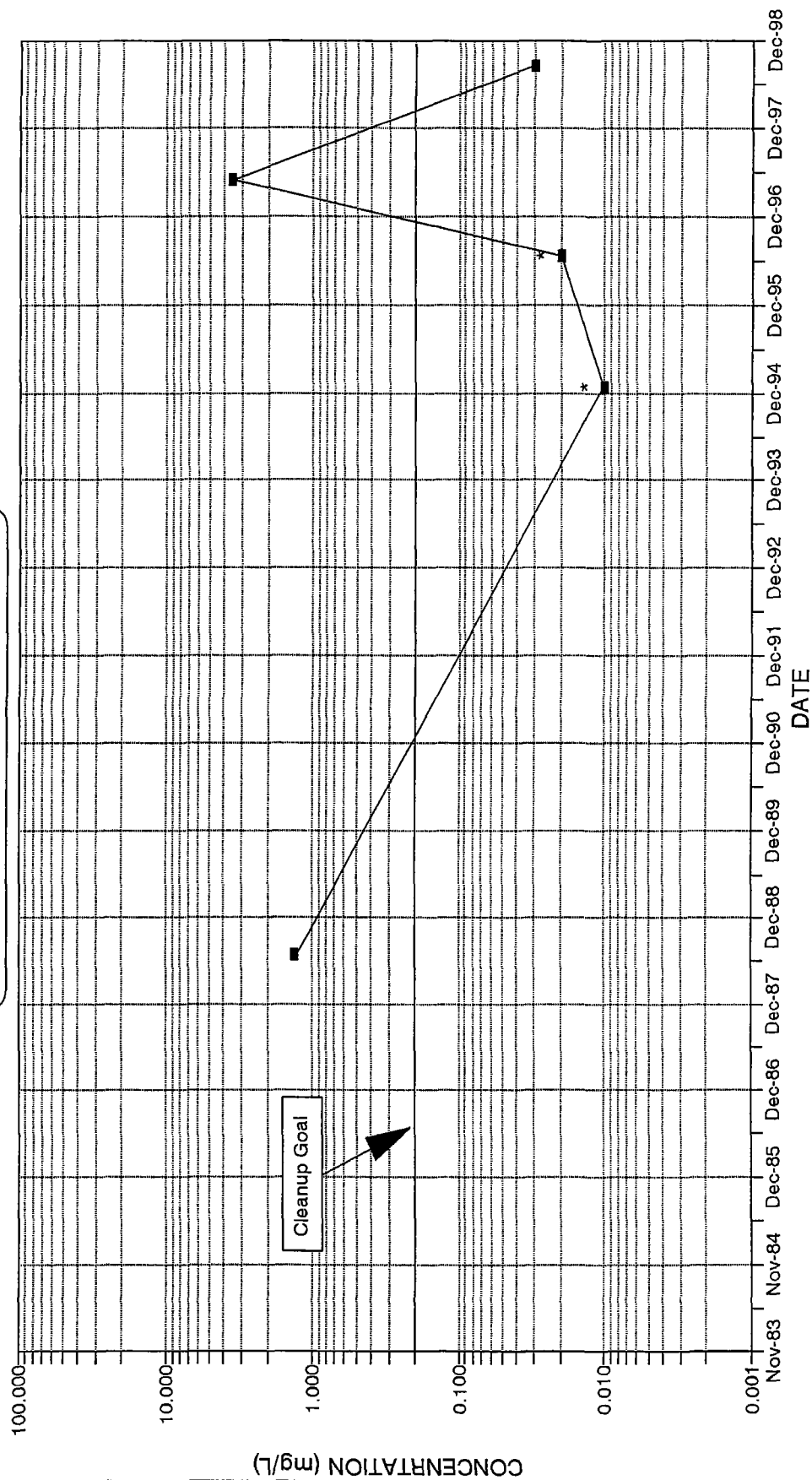
AMENABLE CYANIDE VS. TIME  
MW-35



\* = Value plotted is detection limit

■ MW-35

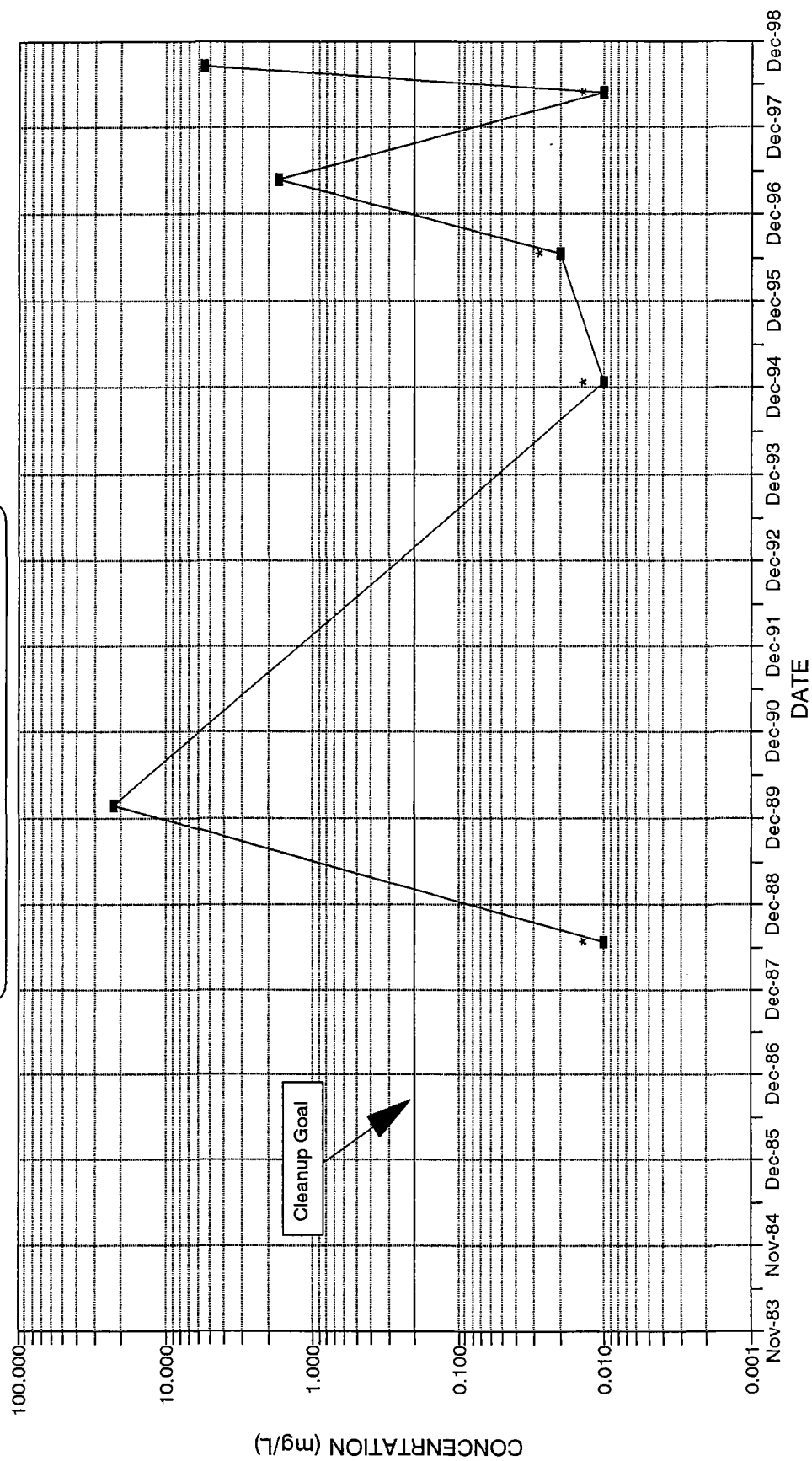
# AMENABLE CYANIDE VS. TIME MW-36



■ MW-36

\* = Value plotted is detection limit

# AMENABLE CYANIDE VS. TIME MW-37



■ MW-37

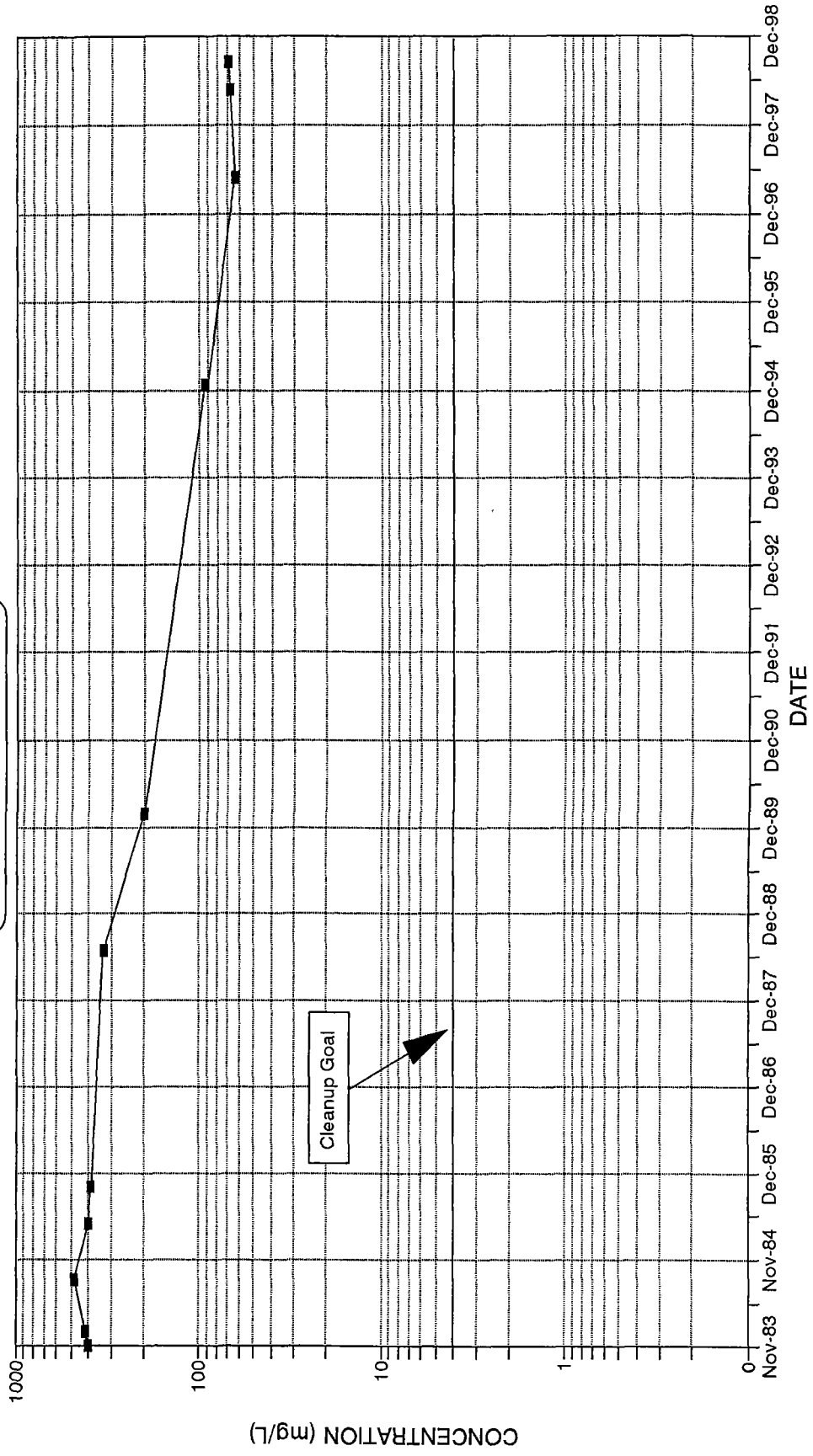
\* = Value plotted is detection limit



APPENDIX D-2

FLUORIDE

# FLUORIDE VS. TIME MW-2

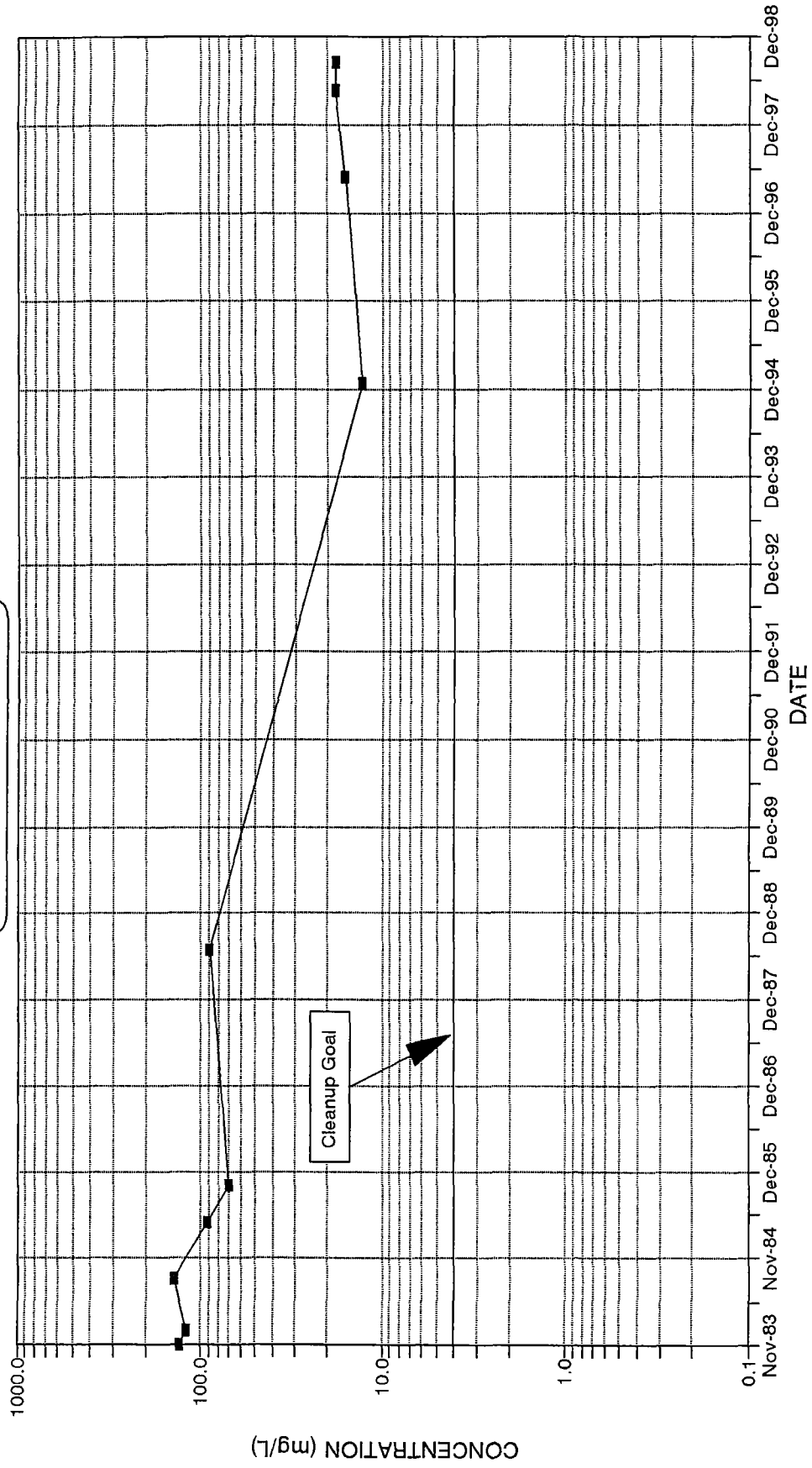


\* = Value plotted is detection limit

■ MW-2

Cleanup Goal

# FLUORIDE VS. TIME MW-5

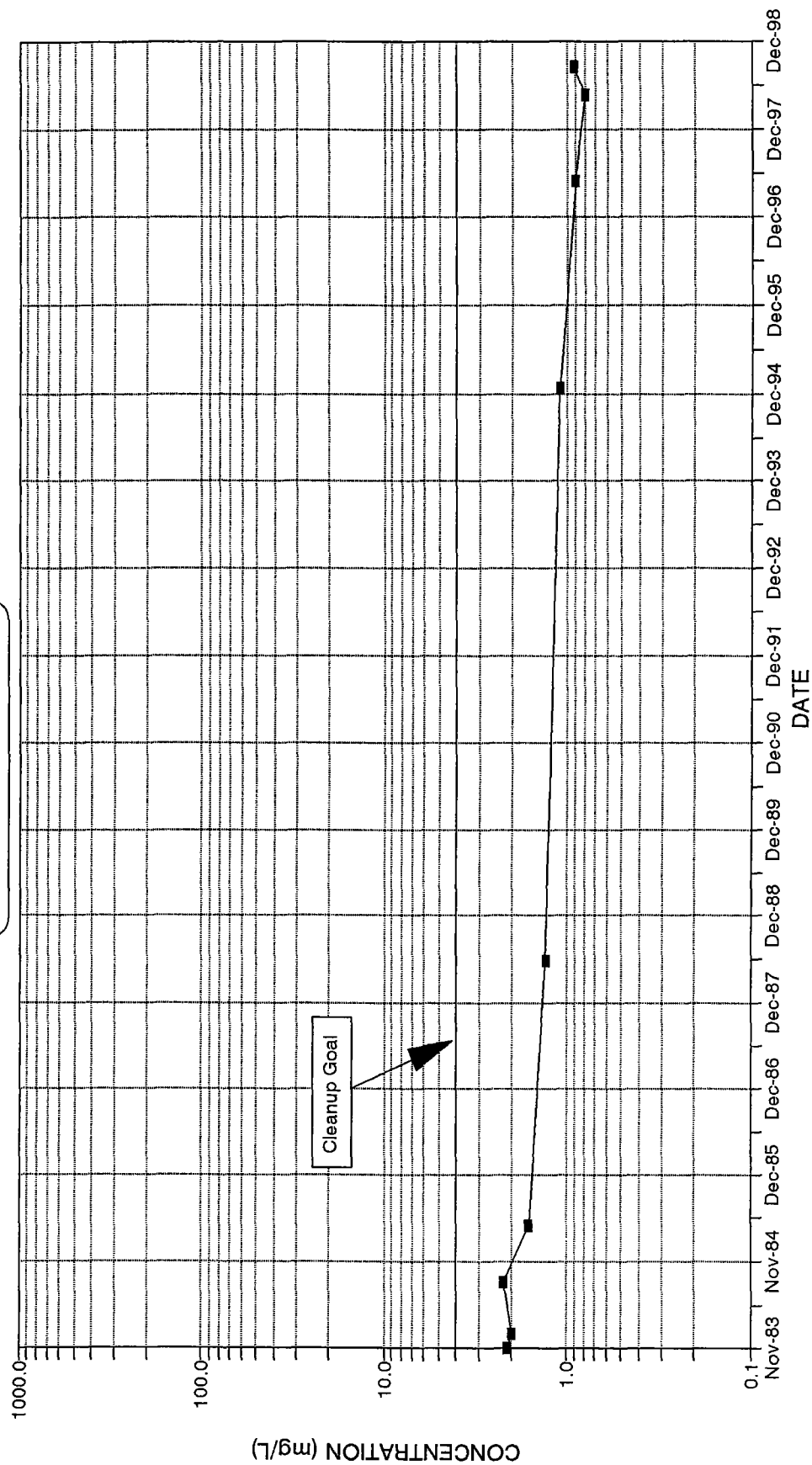


\* = Value plotted is detection limit

■ MW-5



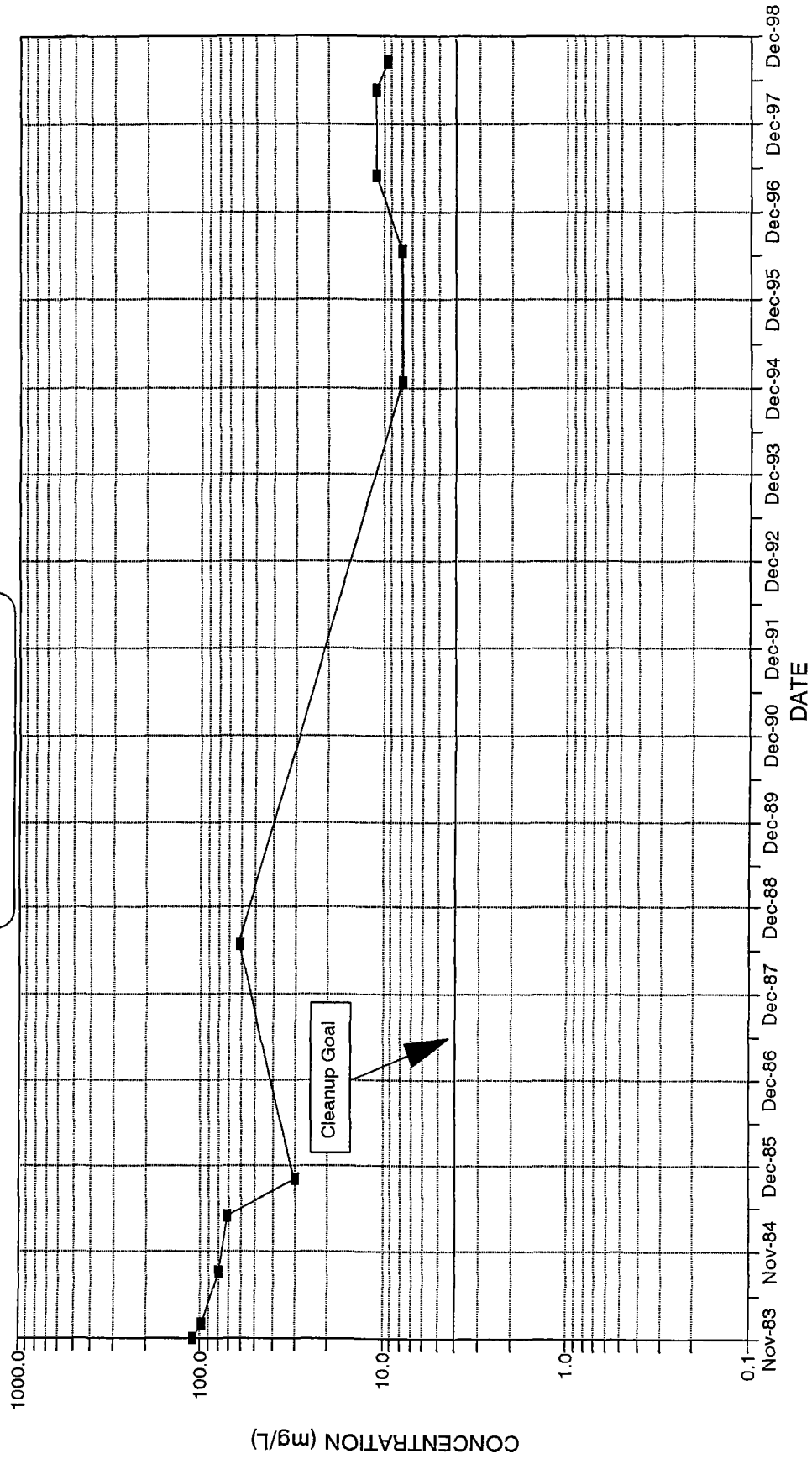
# FLUORIDE VS. TIME MW-12



\* = Value plotted is detection limit

■ MW-12

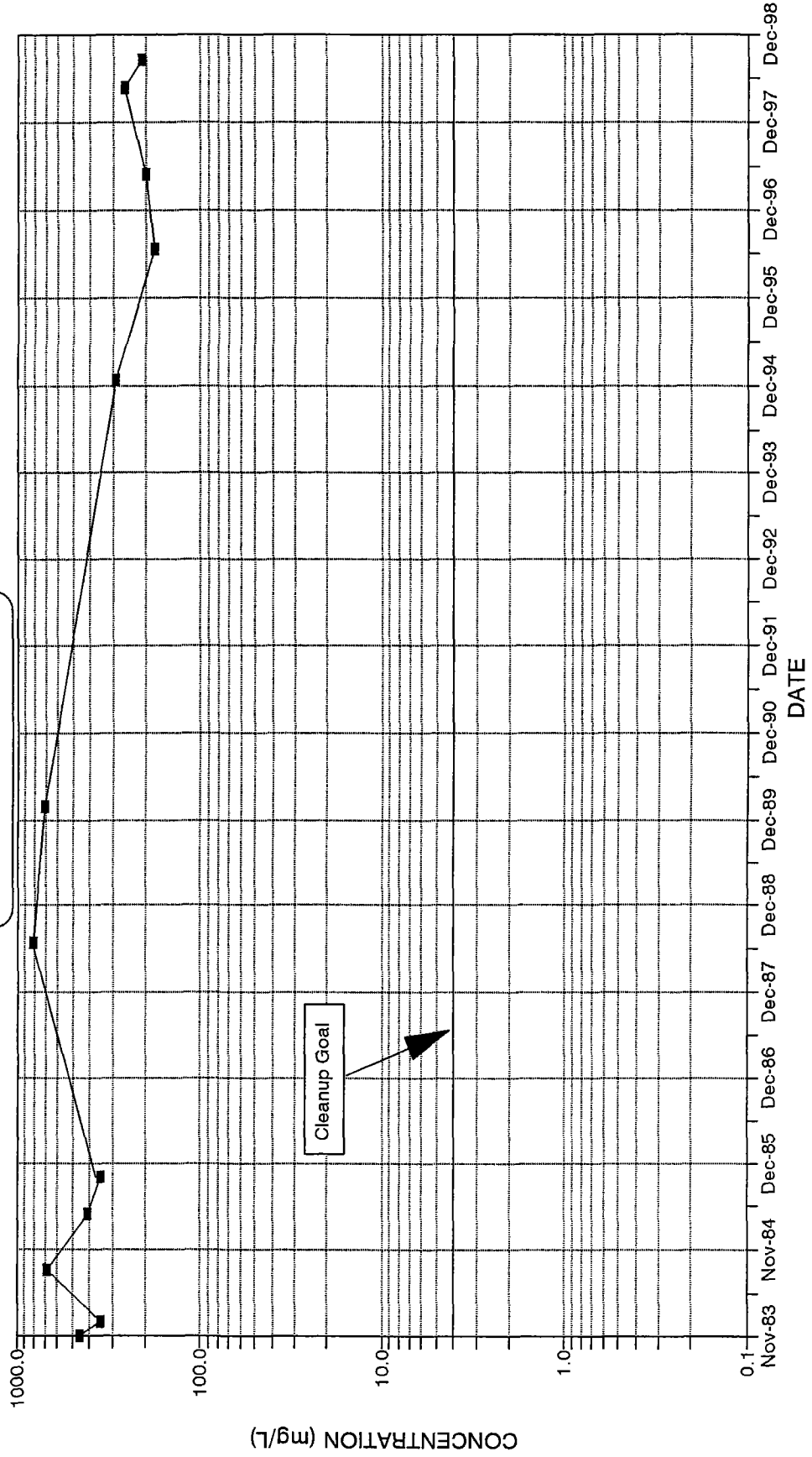
# FLUORIDE VS. TIME MW-16



\* = Value plotted is detection limit

■ MW-16

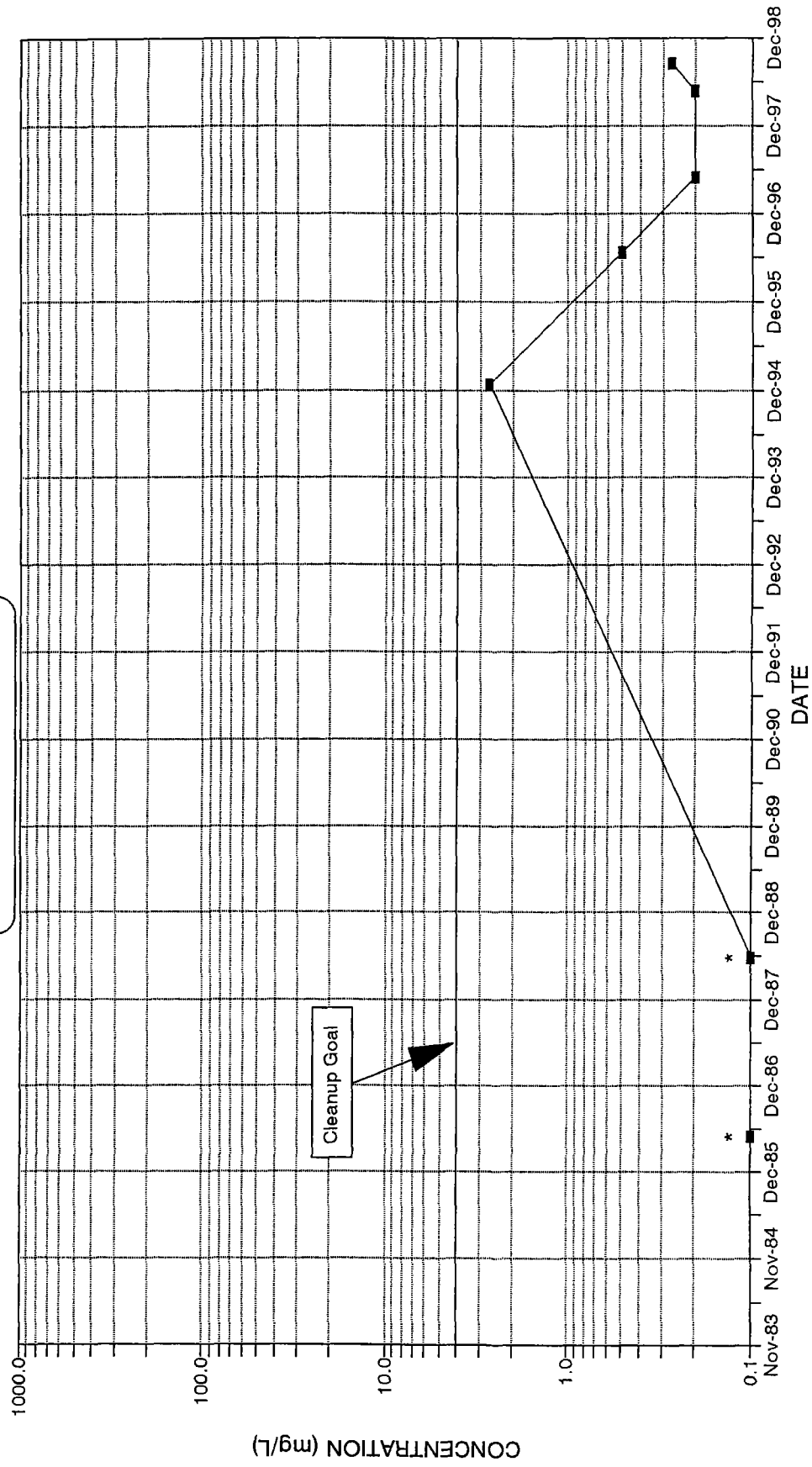
FLUORIDE VS. TIME  
MW-18



\* = Value plotted is detection limit

■ MW-18

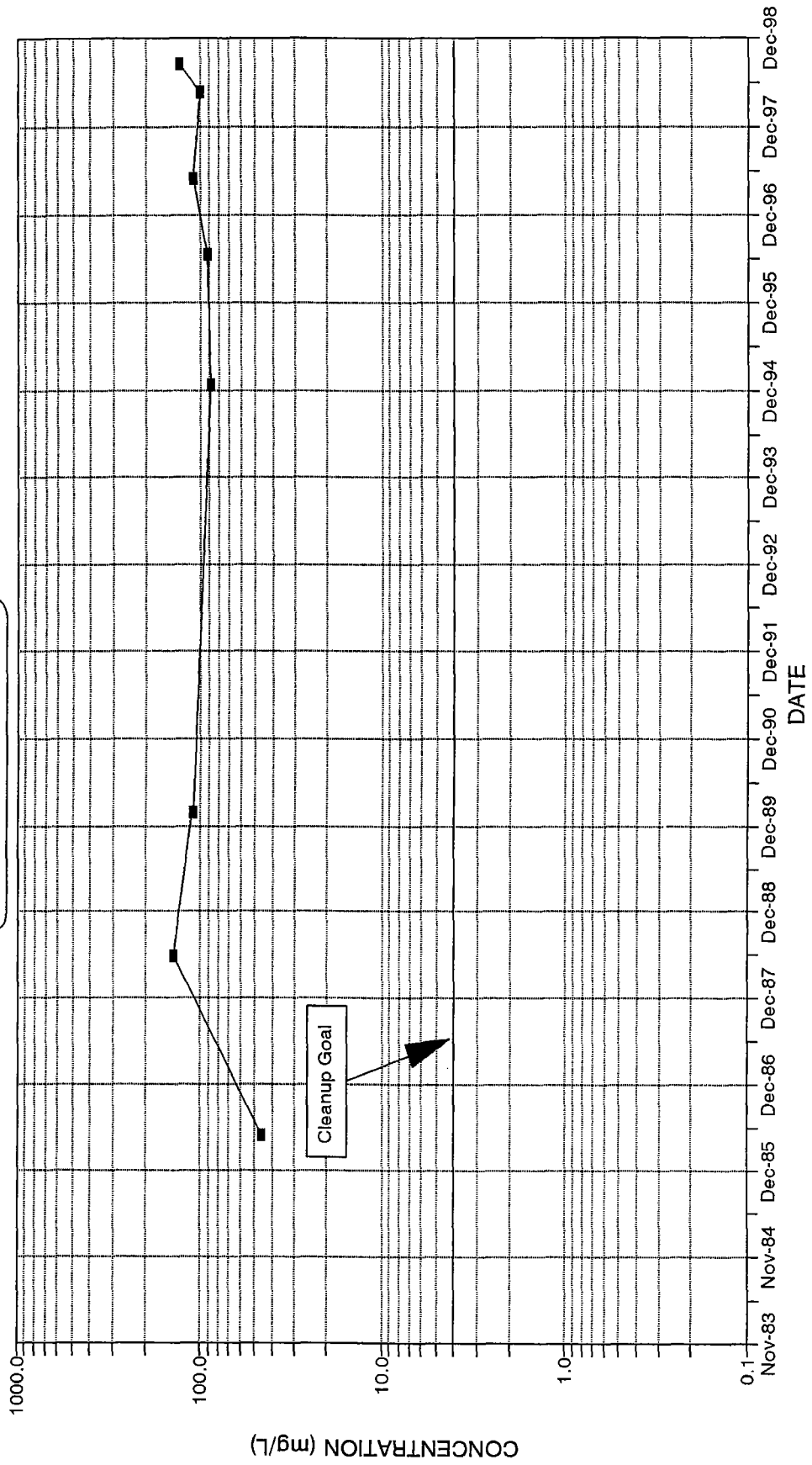
# FLUORIDE VS. TIME MW-28



\* = Value plotted is detection limit

■ MW-28

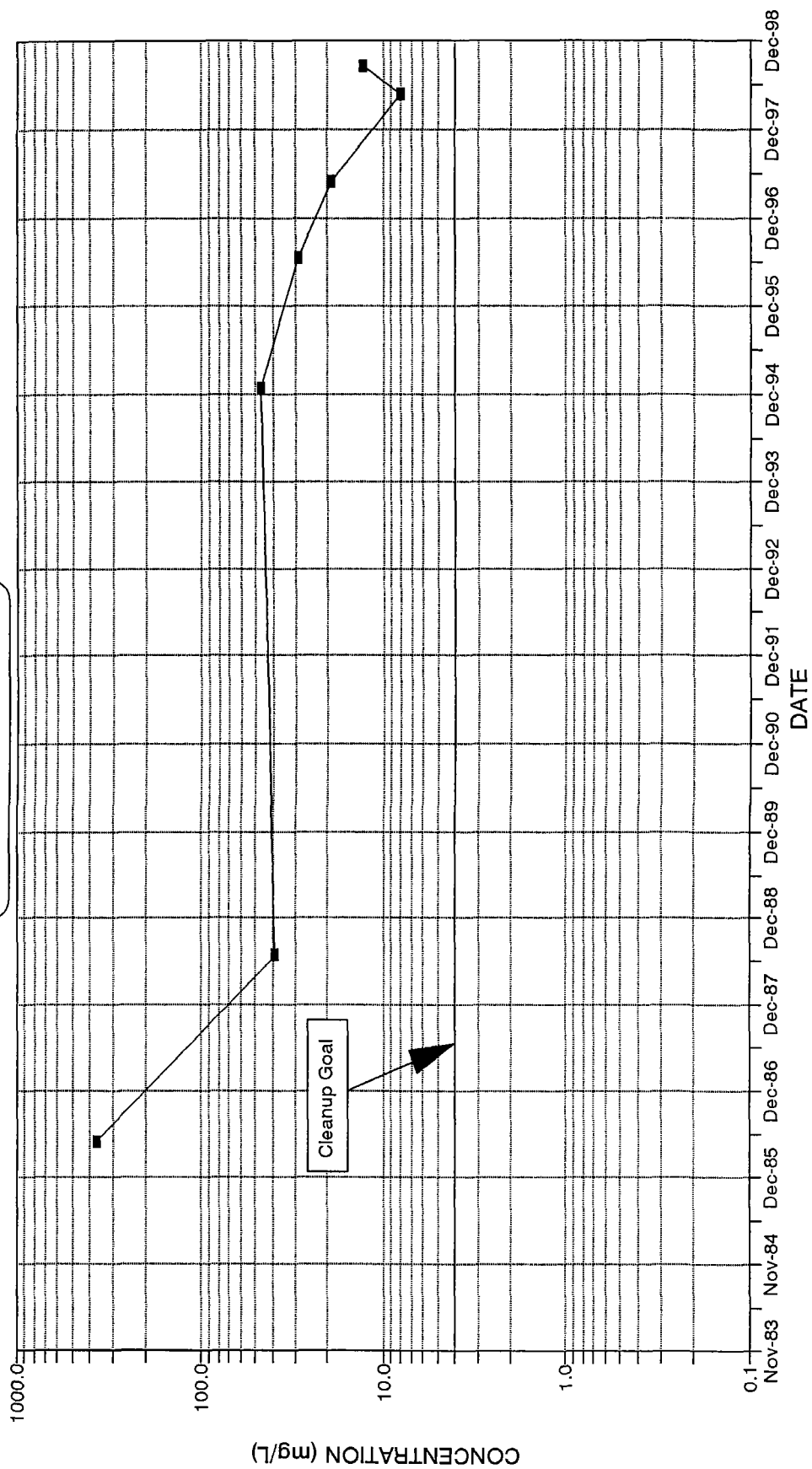
FLUORIDE VS. TIME  
MW-31



\* = Value plotted is detection limit

■ MW-31

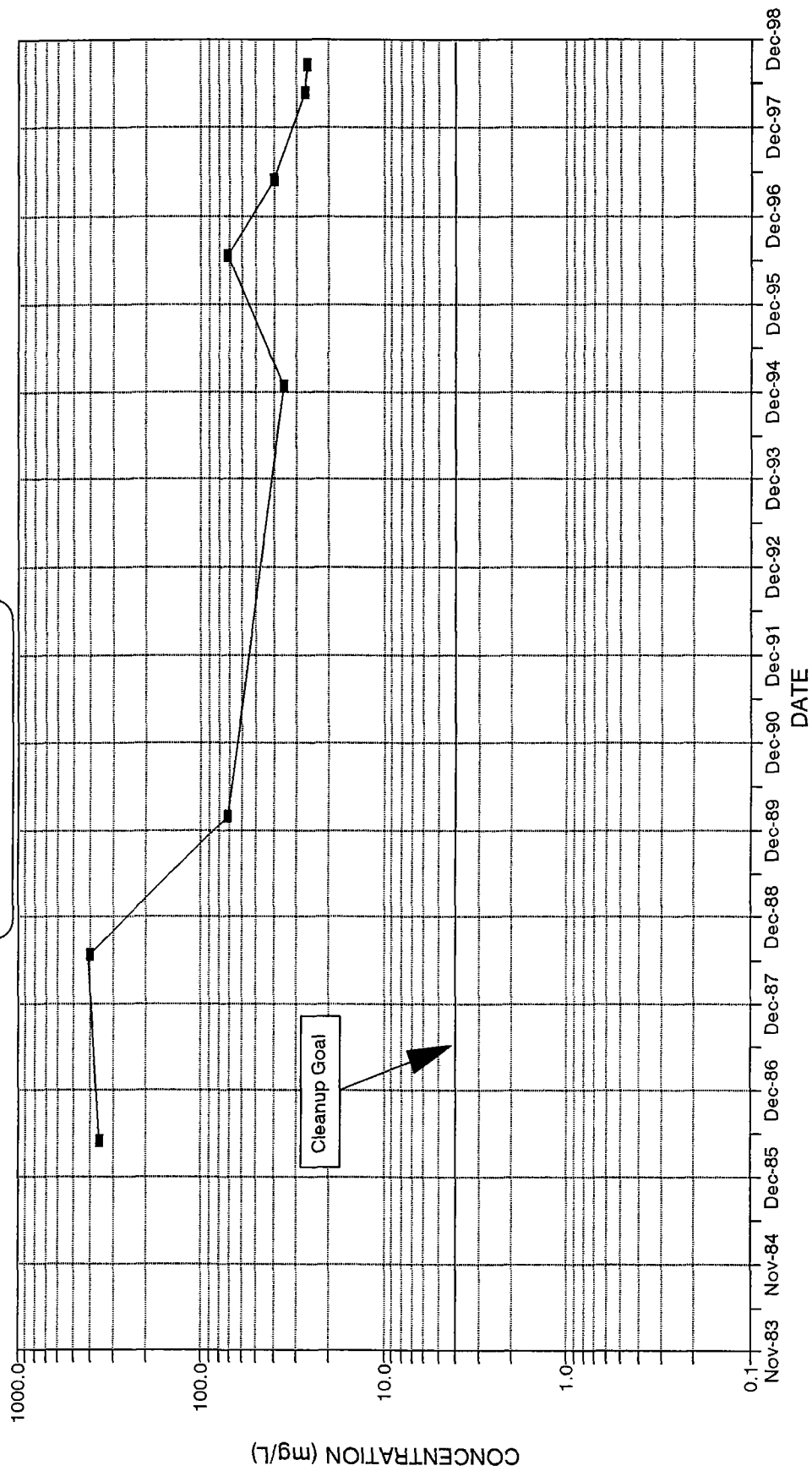
# FLUORIDE VS. TIME MW-32



\* = Value plotted is detection limit

■ MW-32

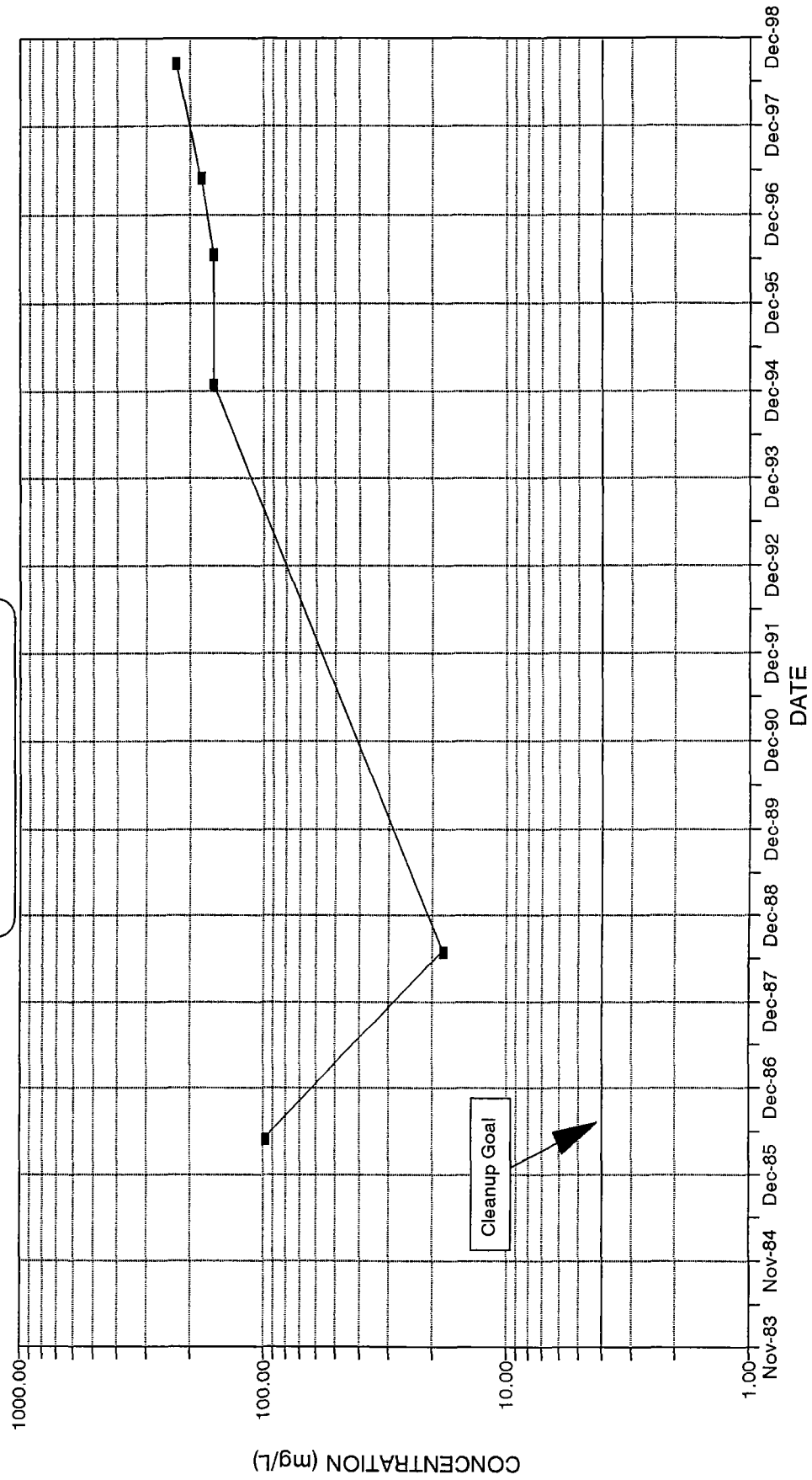
FLUORIDE VS. TIME  
MW-35



\* = Value plotted is detection limit

■ MW-35

FLUORIDE VS. TIME  
MW-36

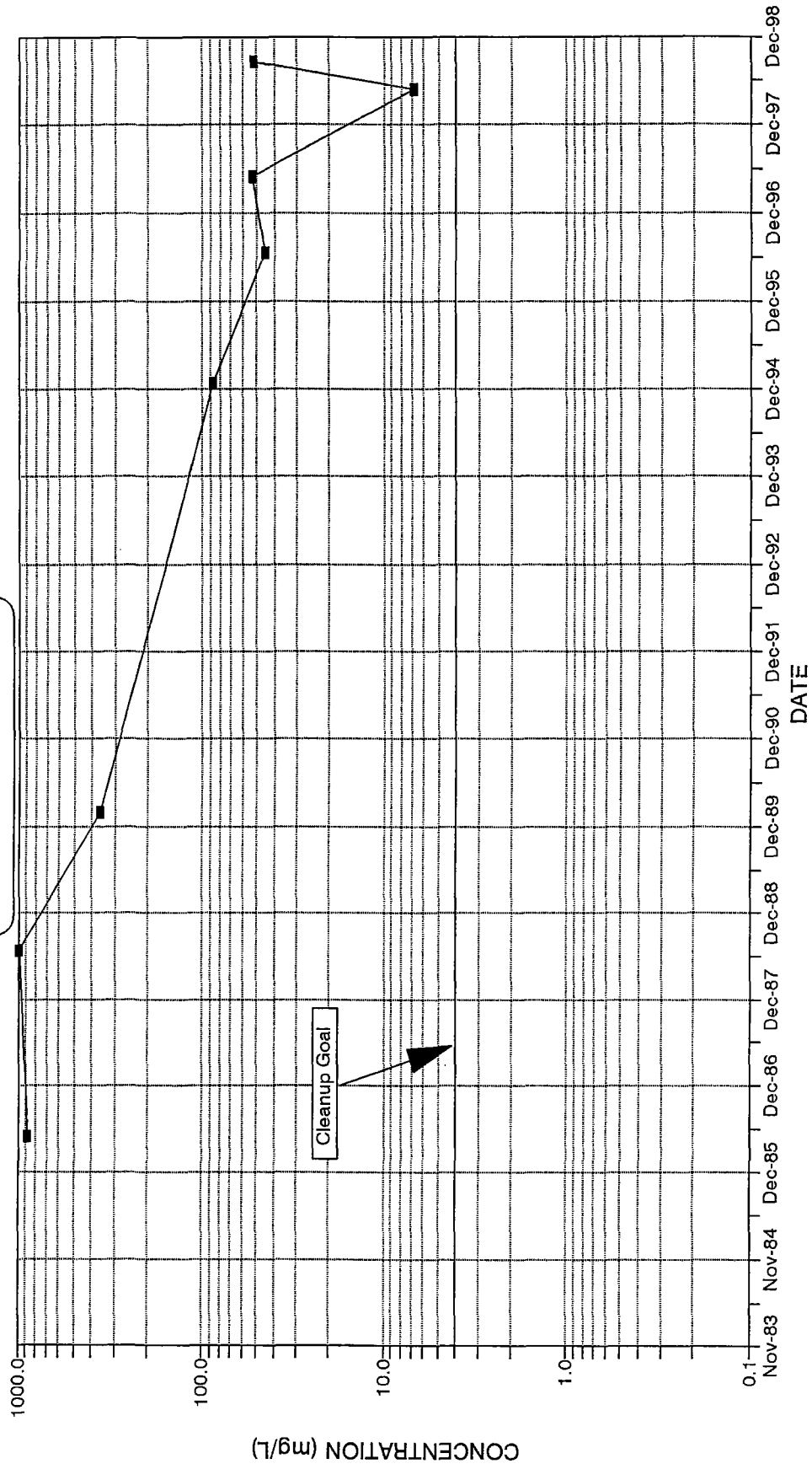


\* = Value plotted is detection limit

■ MW-36



FLUORIDE VS. TIME  
MW-37



\* = Value plotted is detection limit

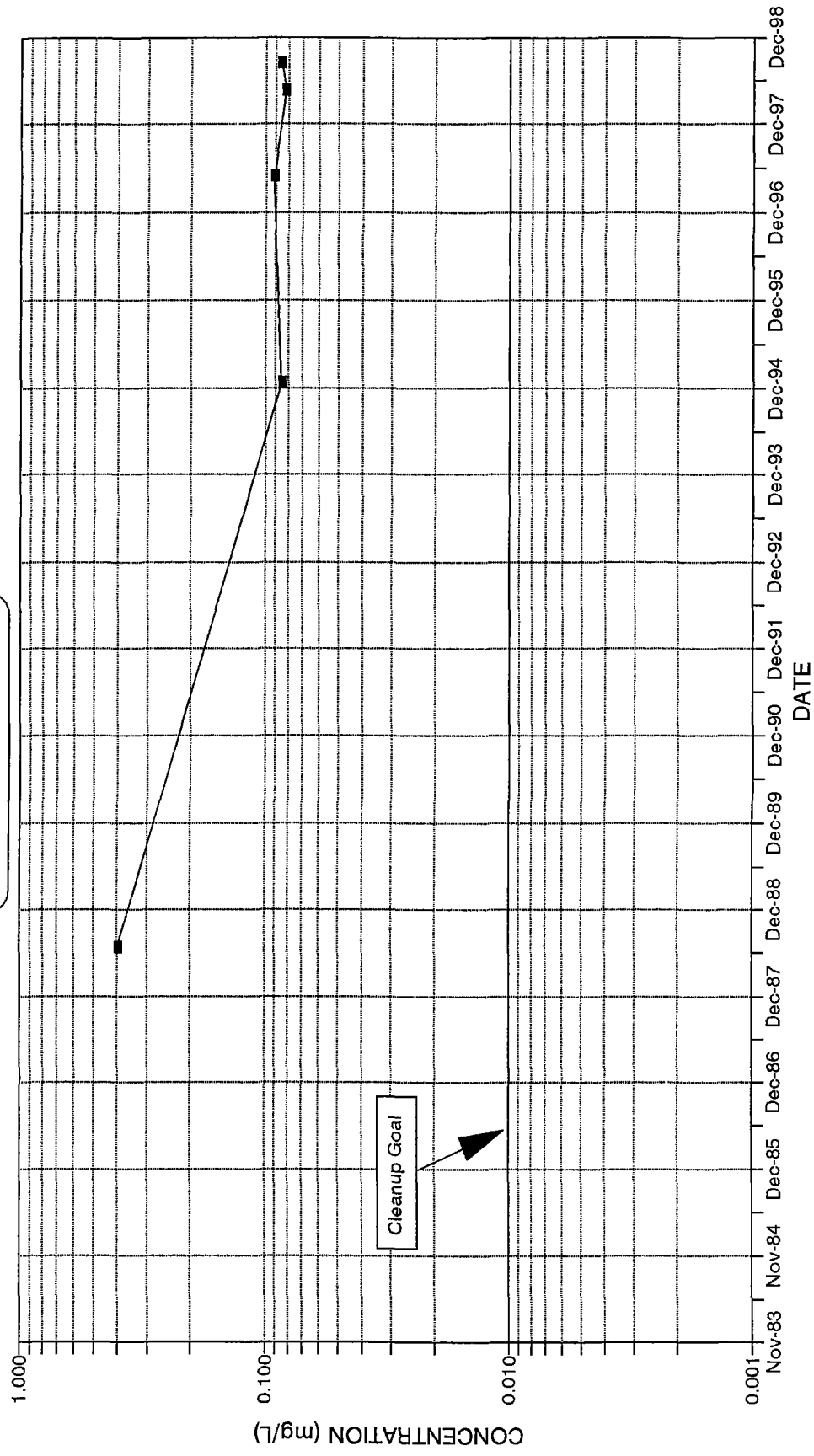
■ MW-37



## APPENDIX D-3

### ARSENIC

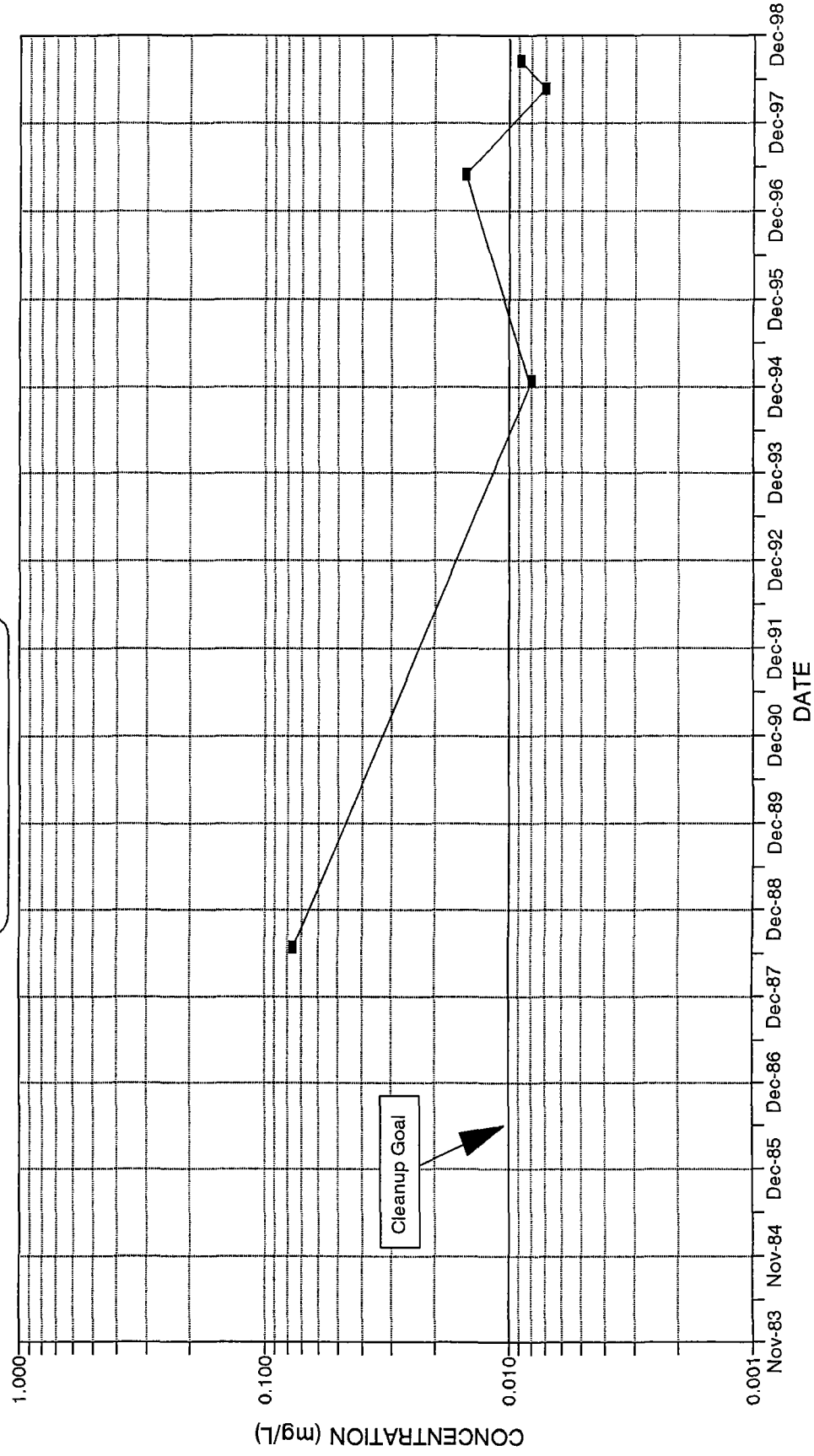
ARSENIC VS. TIME  
MW-2



\* = Value plotted is detection limit

■ MW-2

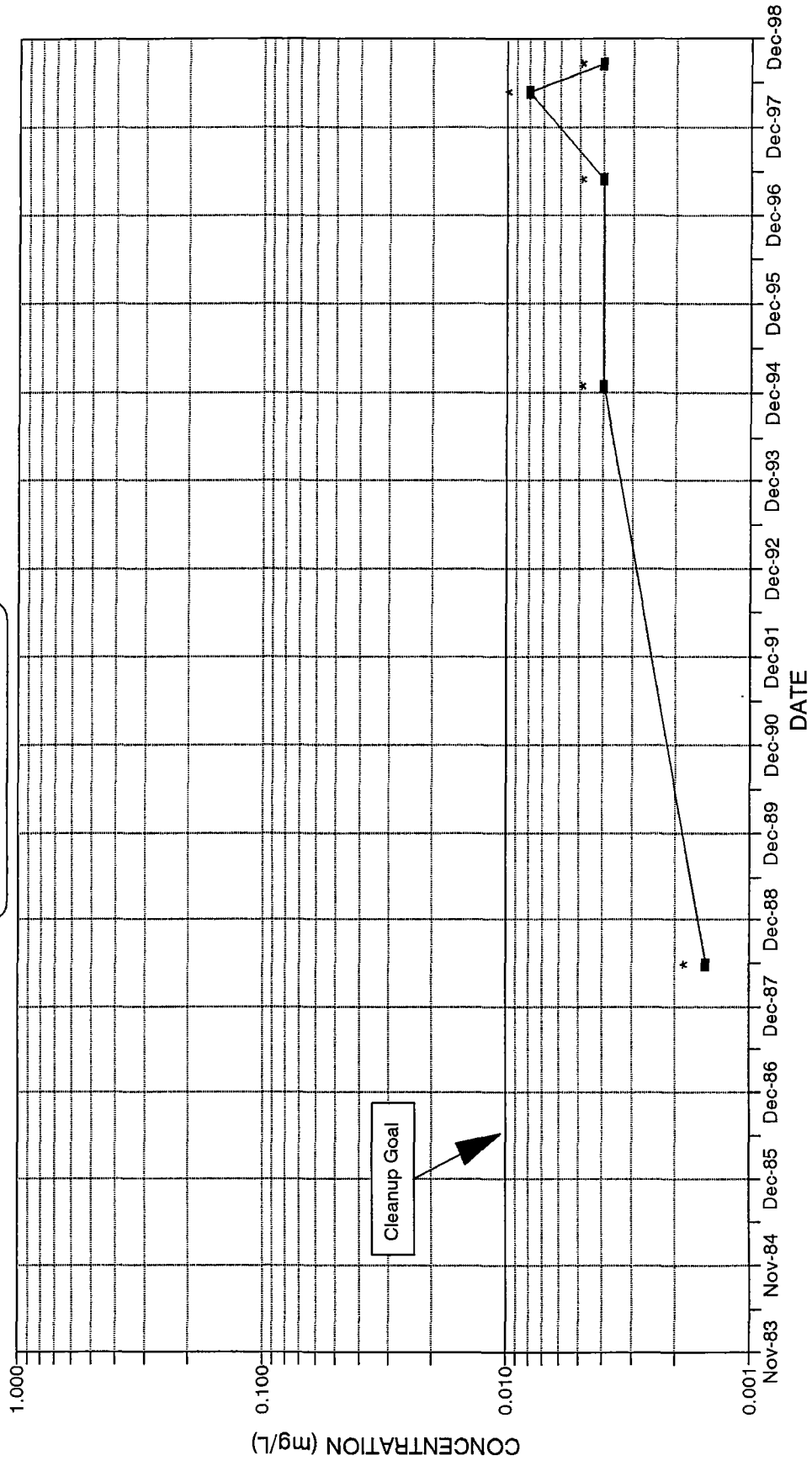
ARSENIC VS. TIME  
MW-5



\* = Value plotted is detection limit

■ - MW-5

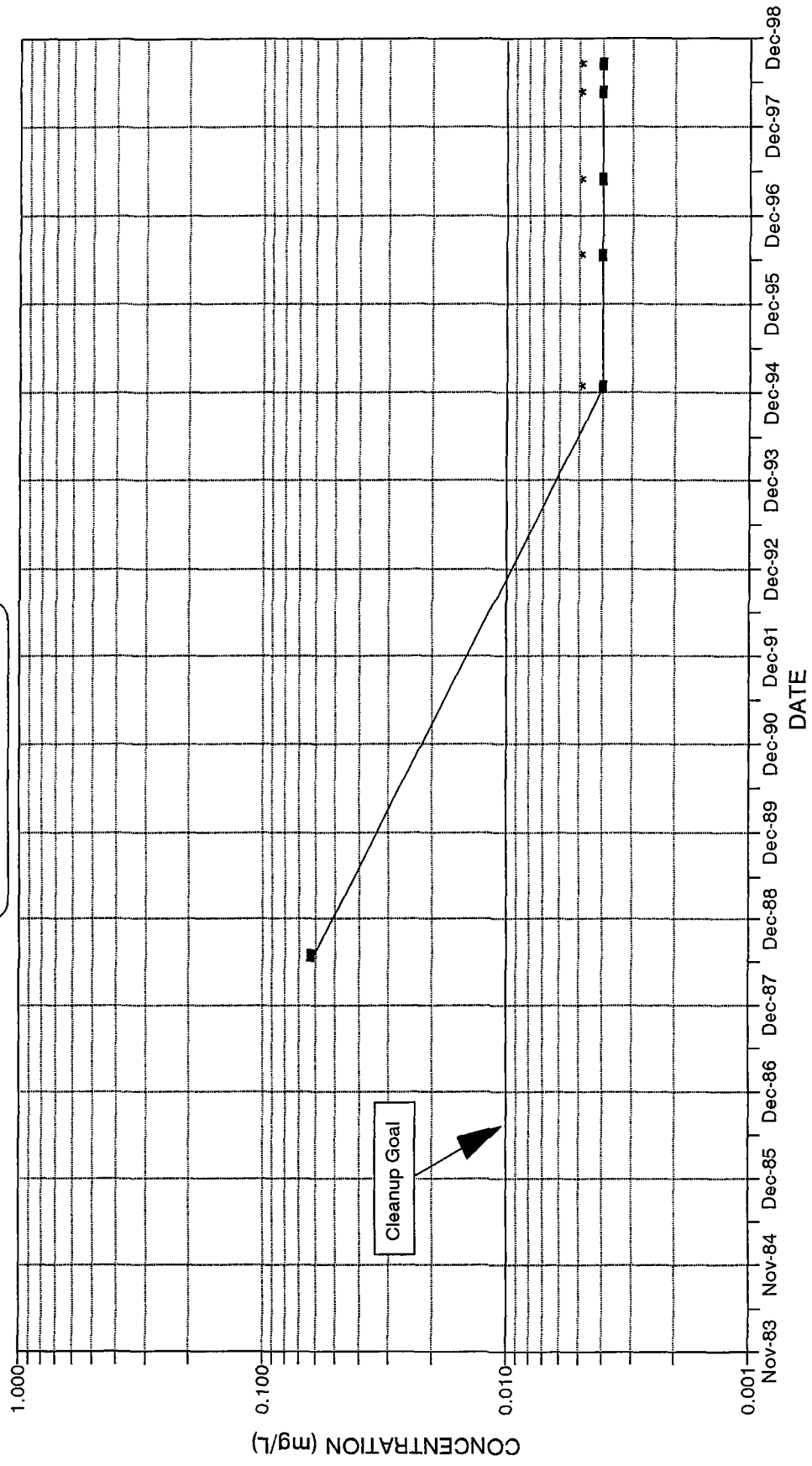
ARSENIC VS. TIME  
MW-12



\* = Value plotted is detection limit

■ MW-12

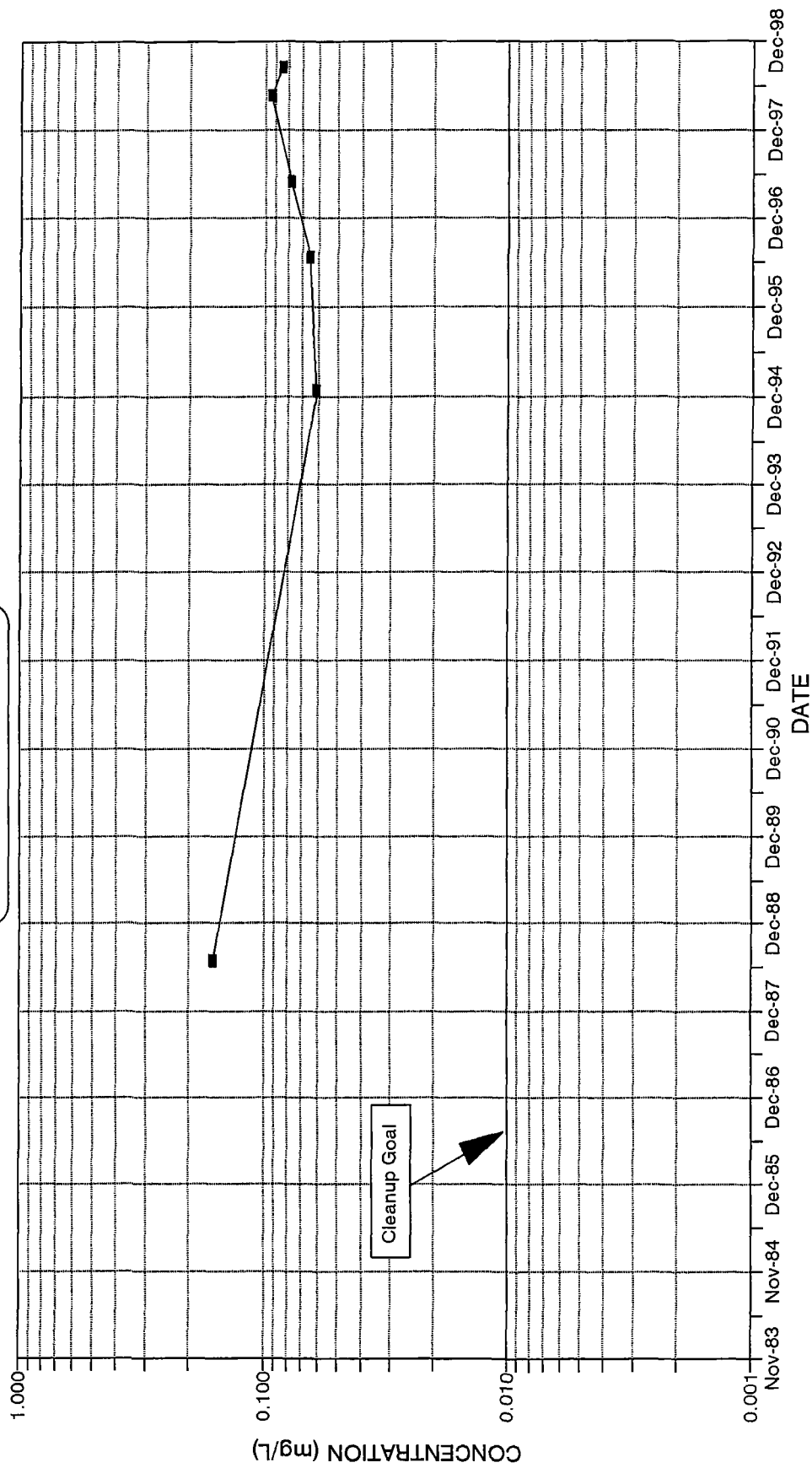
ARSENIC VS. TIME  
MW-16



\* = Value plotted is detection limit

■ MW-16

ARSENIC VS. TIME  
MW-18

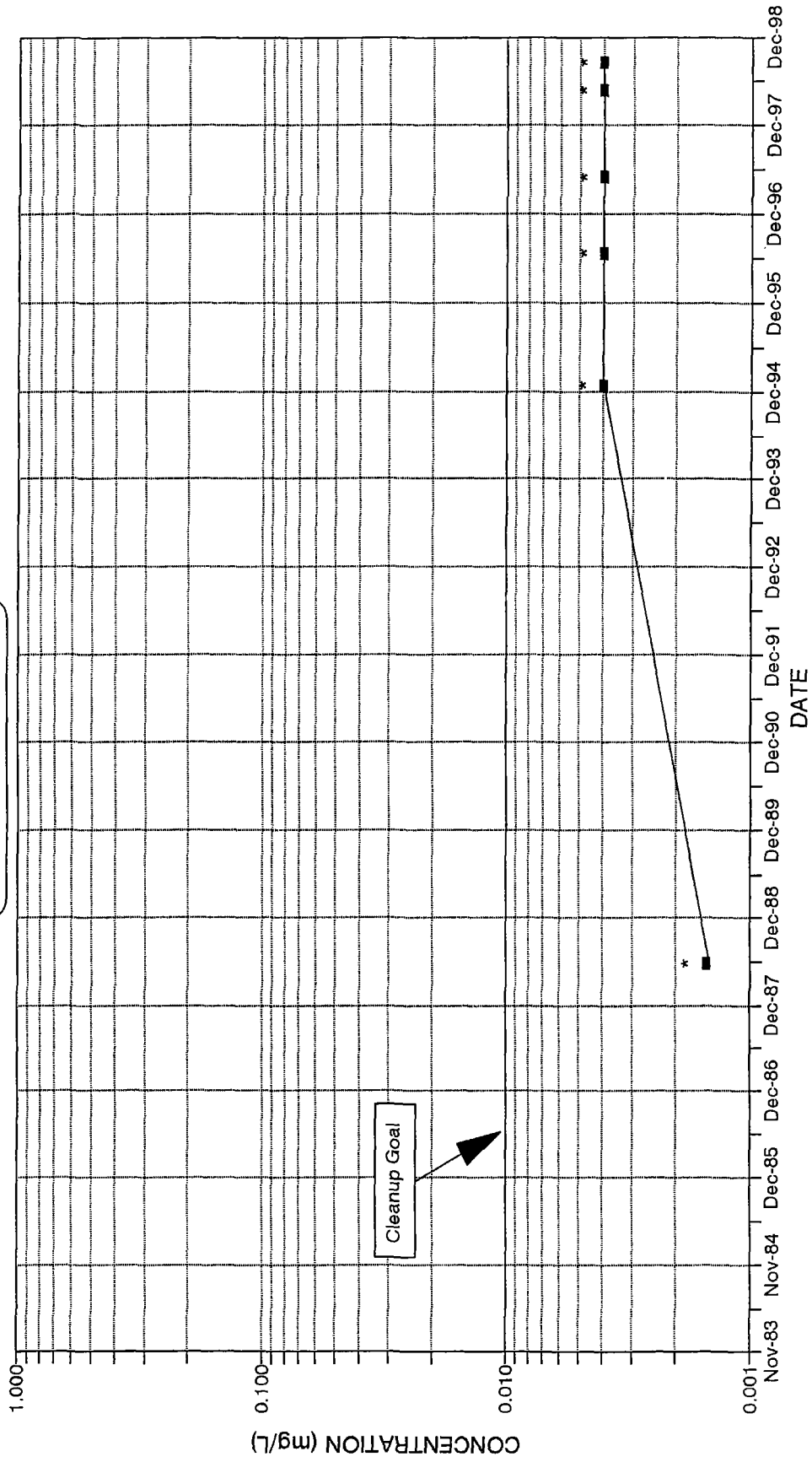


■ MW-18

\* = Value plotted is detection limit



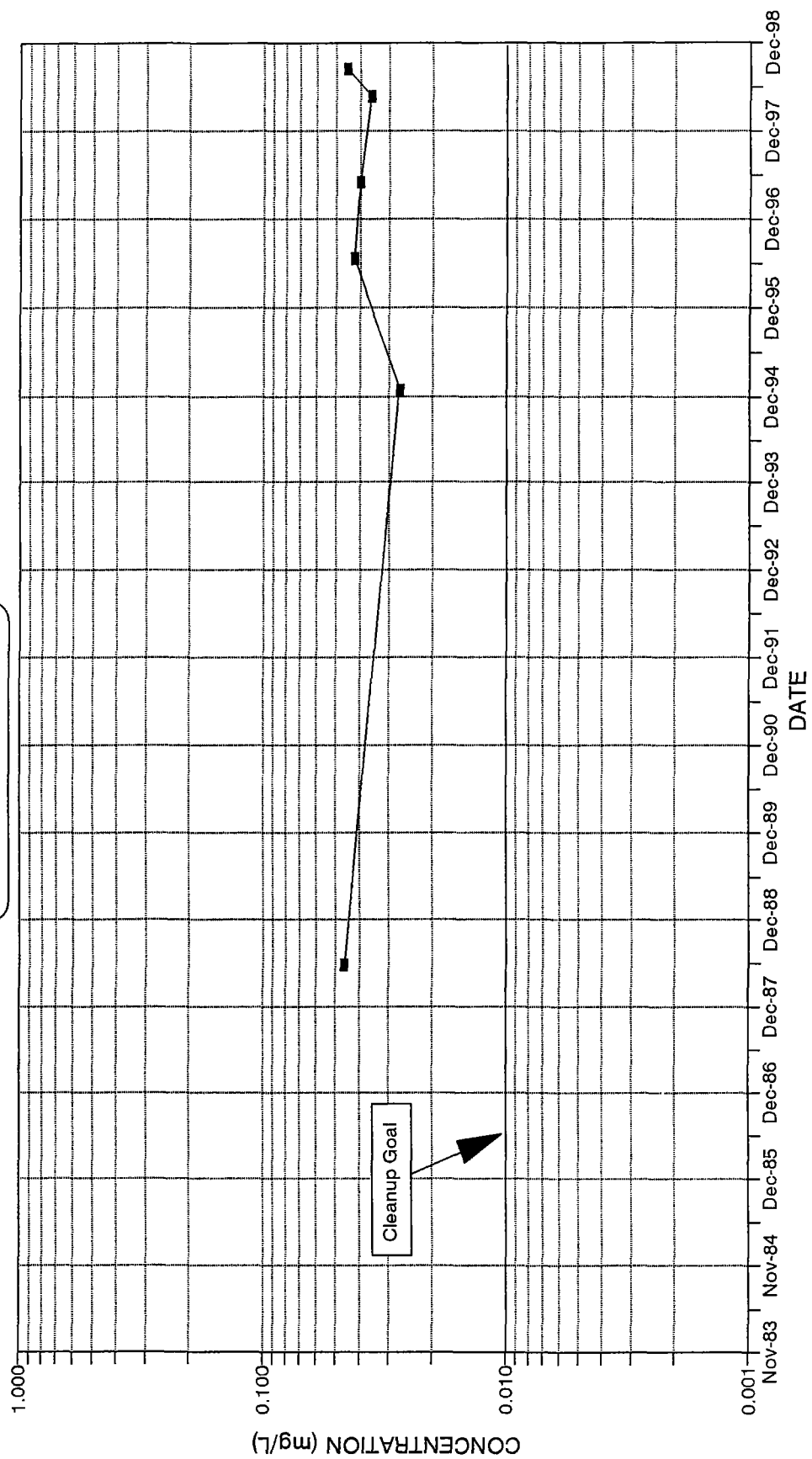
# ARSENIC VS. TIME MW-28



\* = Value plotted is detection limit

■ MW-28

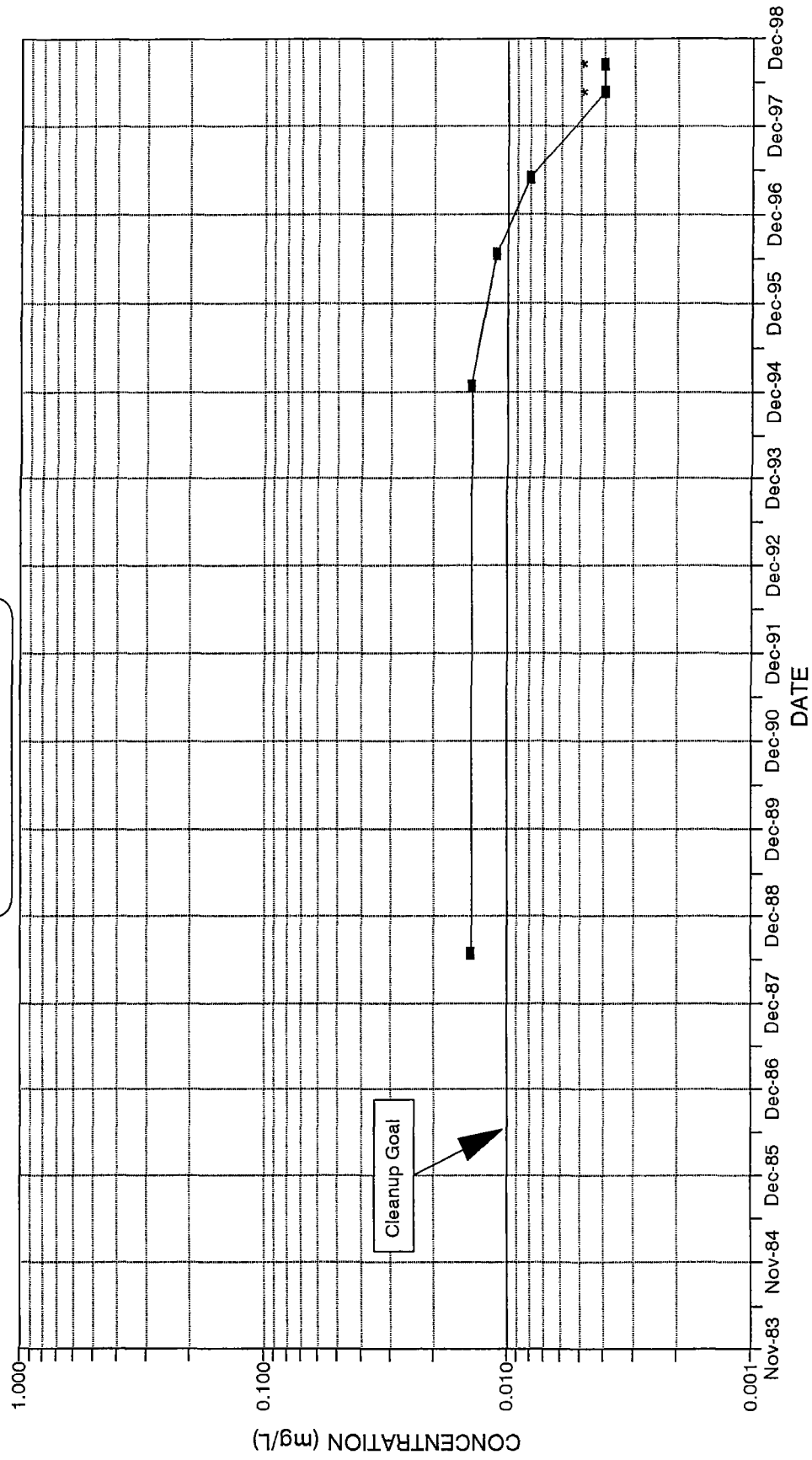
ARSENIC VS. TIME  
MW-31



■ MW-31

\* = Value plotted is detection limit

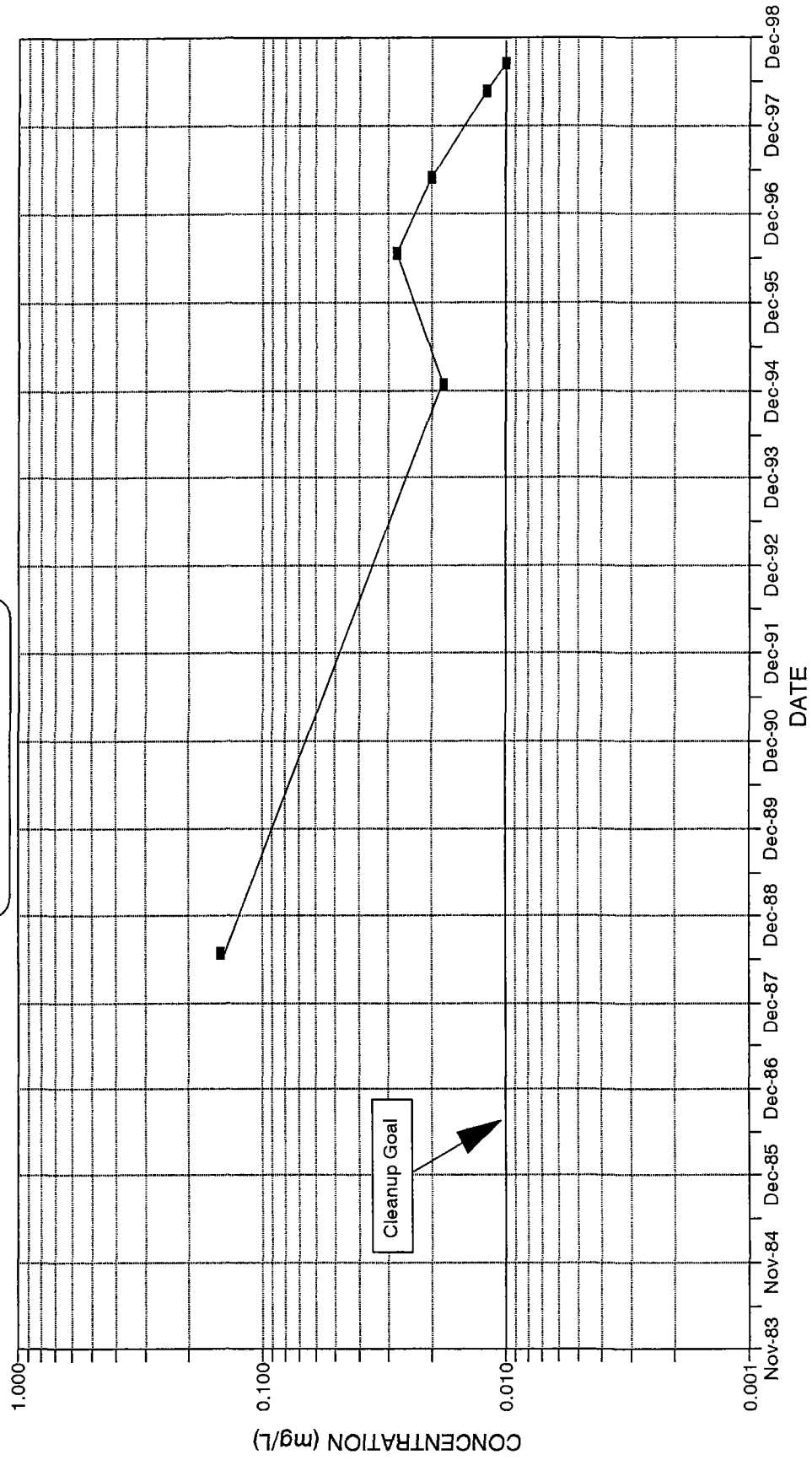
ARSENIC VS. TIME  
MW-32



■ MW-32

\* = Value plotted is detection limit

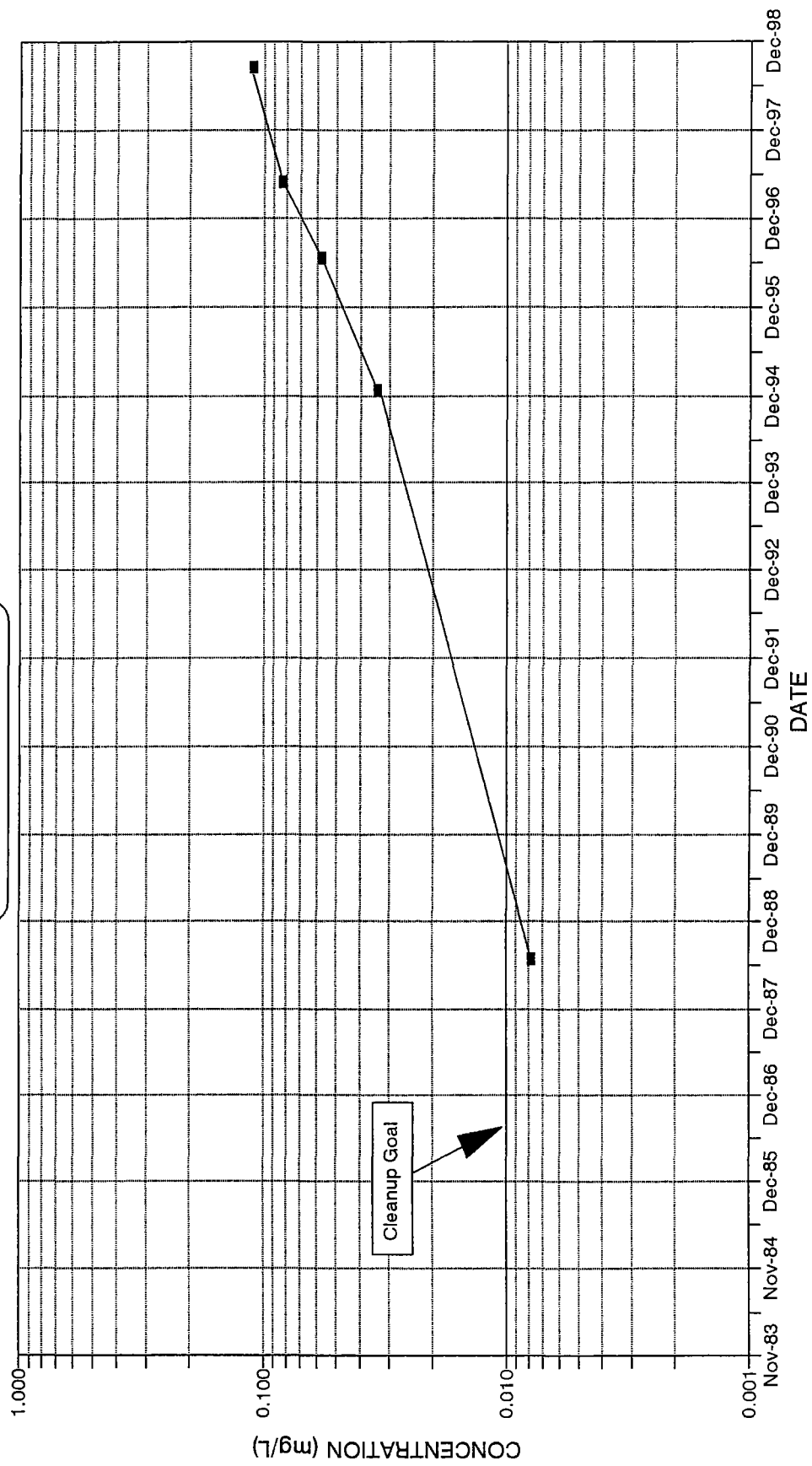
# ARSENIC VS. TIME MW-35



\* = Value plotted is detection limit

■ MW-35

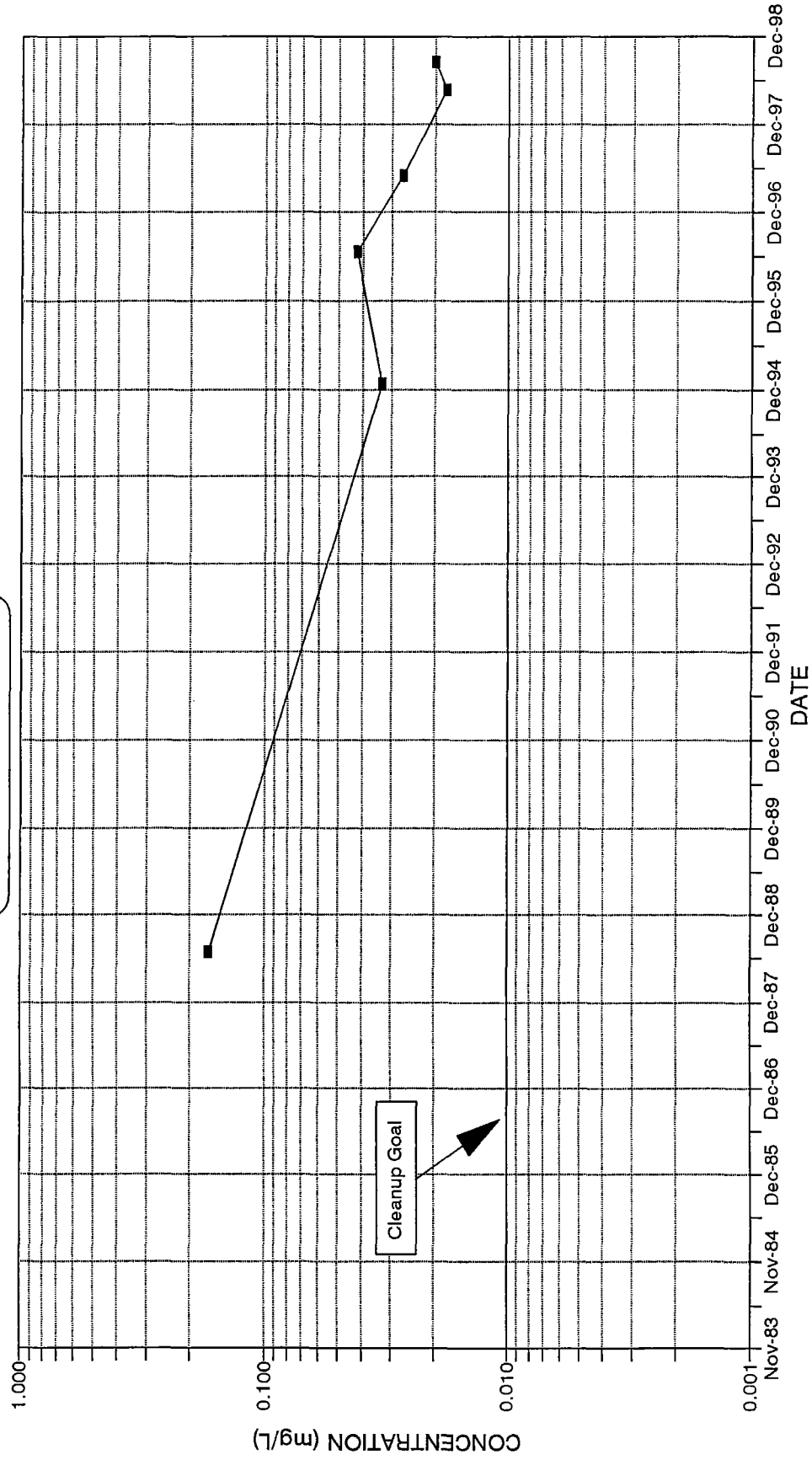
ARSENIC VS. TIME  
MW-36



■ MW-36

\* = Value plotted is detection limit

ARSENIC VS. TIME  
MW-37



■ MW-37

\* = Value plotted is detection limit

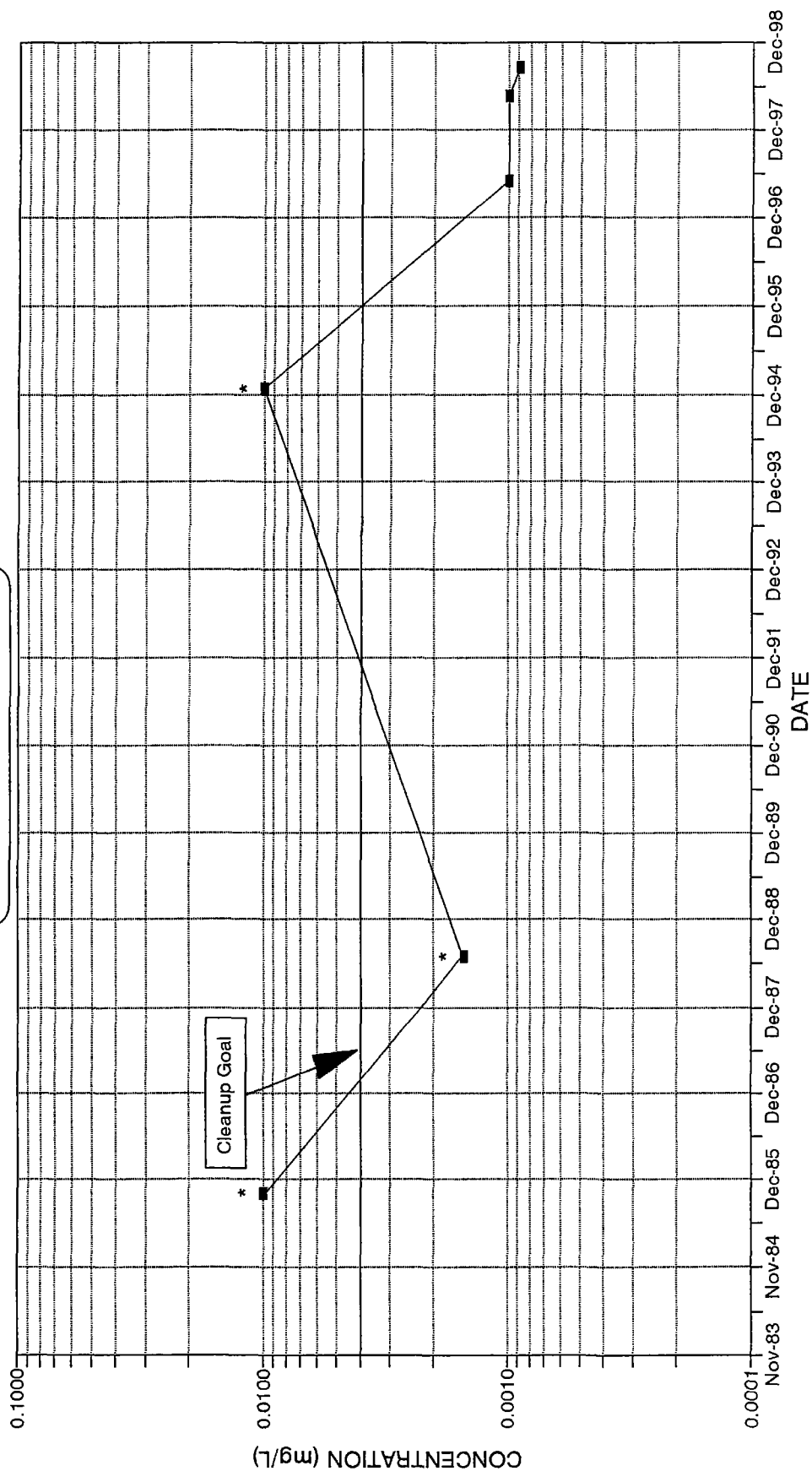


APPENDIX D-4

BERYLLIUM



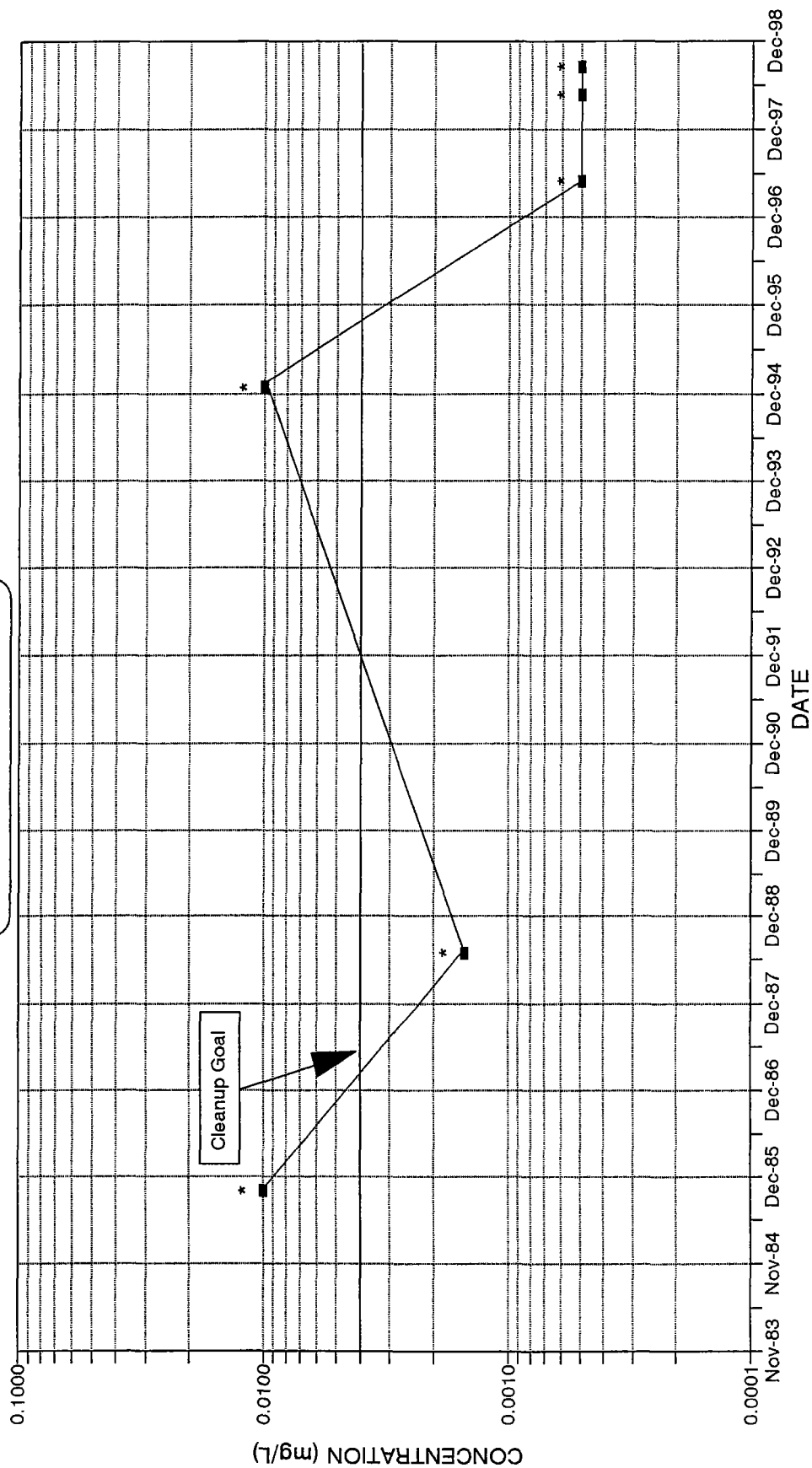
# BERYLLIUM VS. TIME MW-2



\* = Value plotted is detection limit

■ MW-2

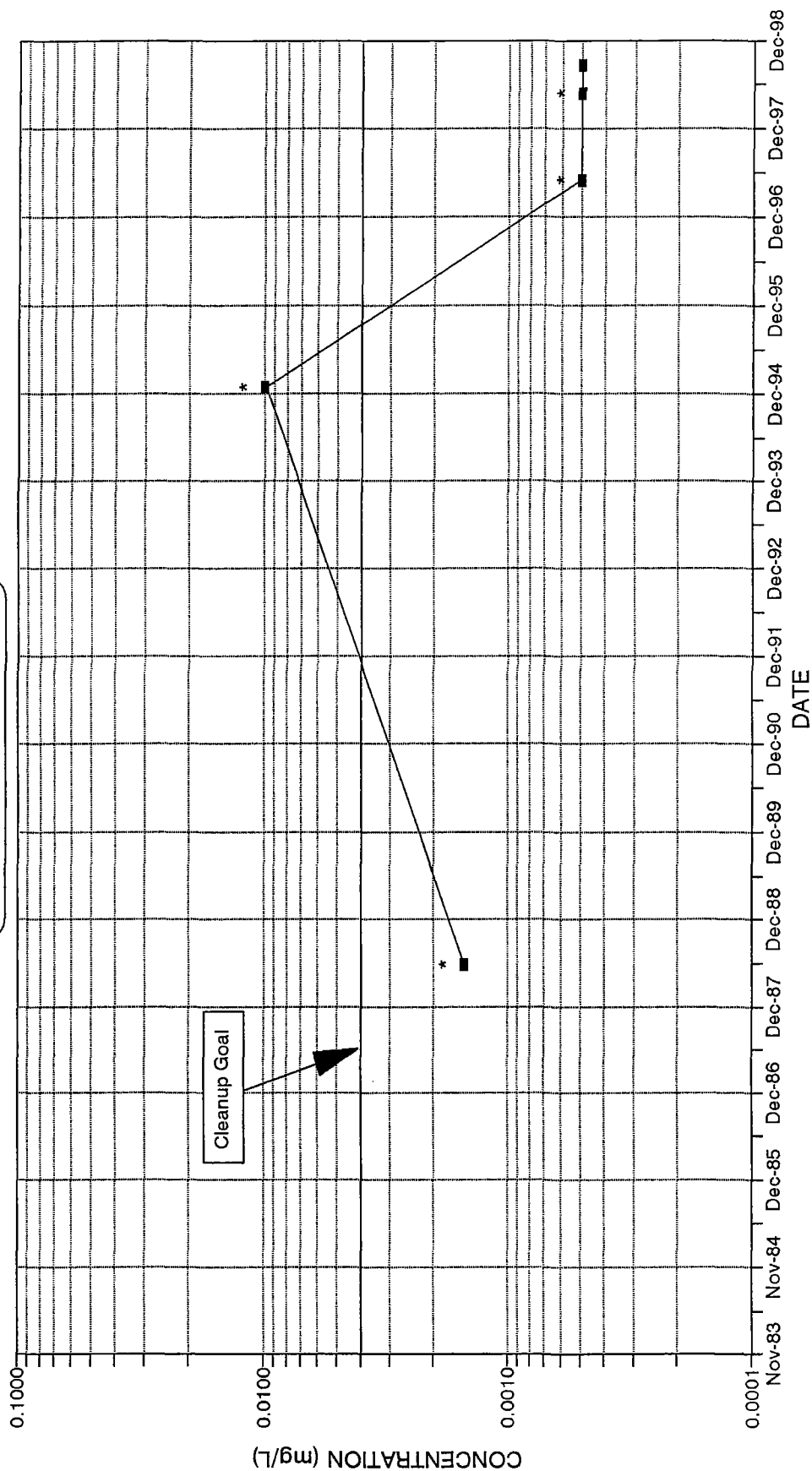
# BERYLLIUM VS. TIME MW-5



■ MW-5

\* = Value plotted is detection limit

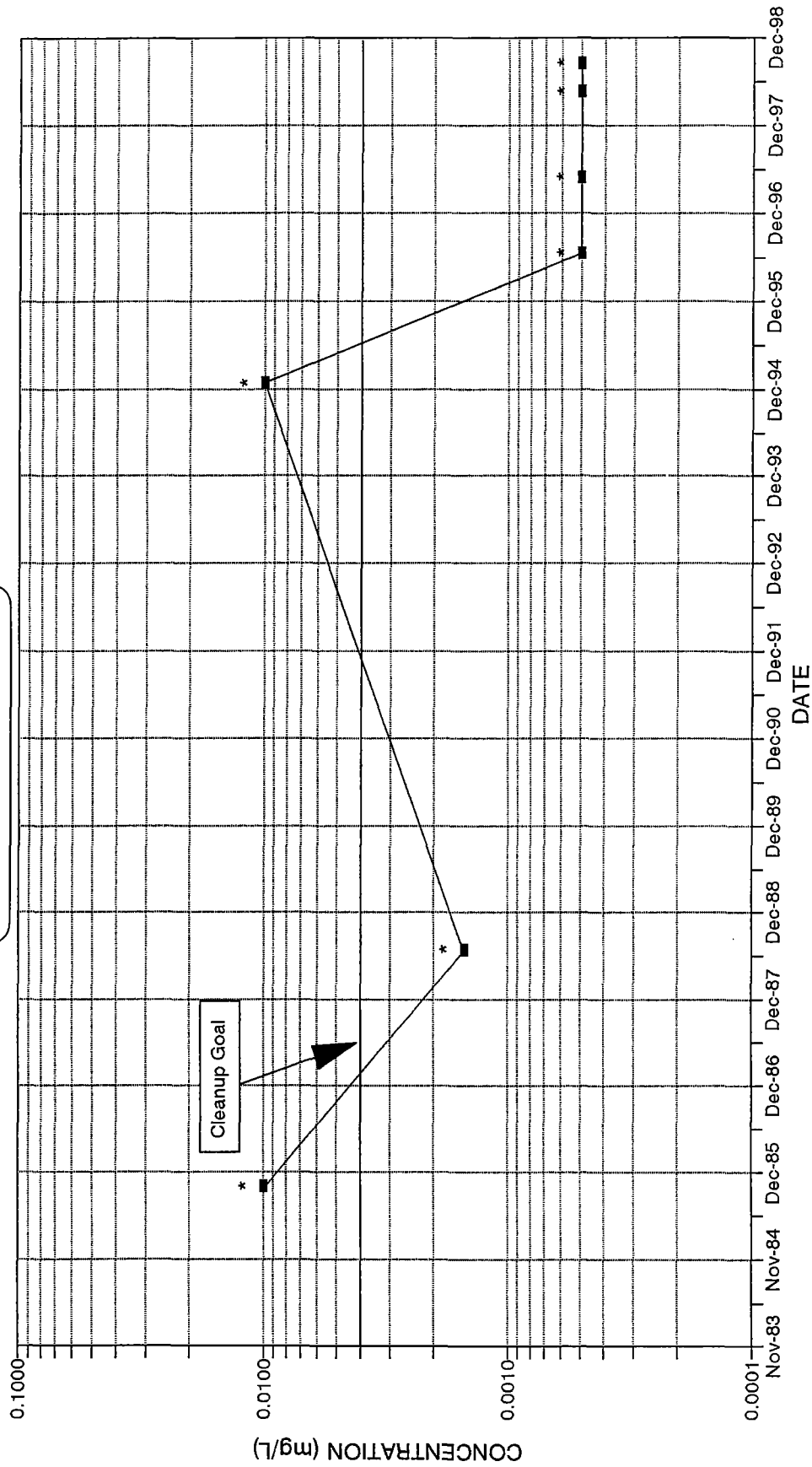
# BERYLLIUM VS. TIME MW-12



■ MW-12

\* = Value plotted is detection limit

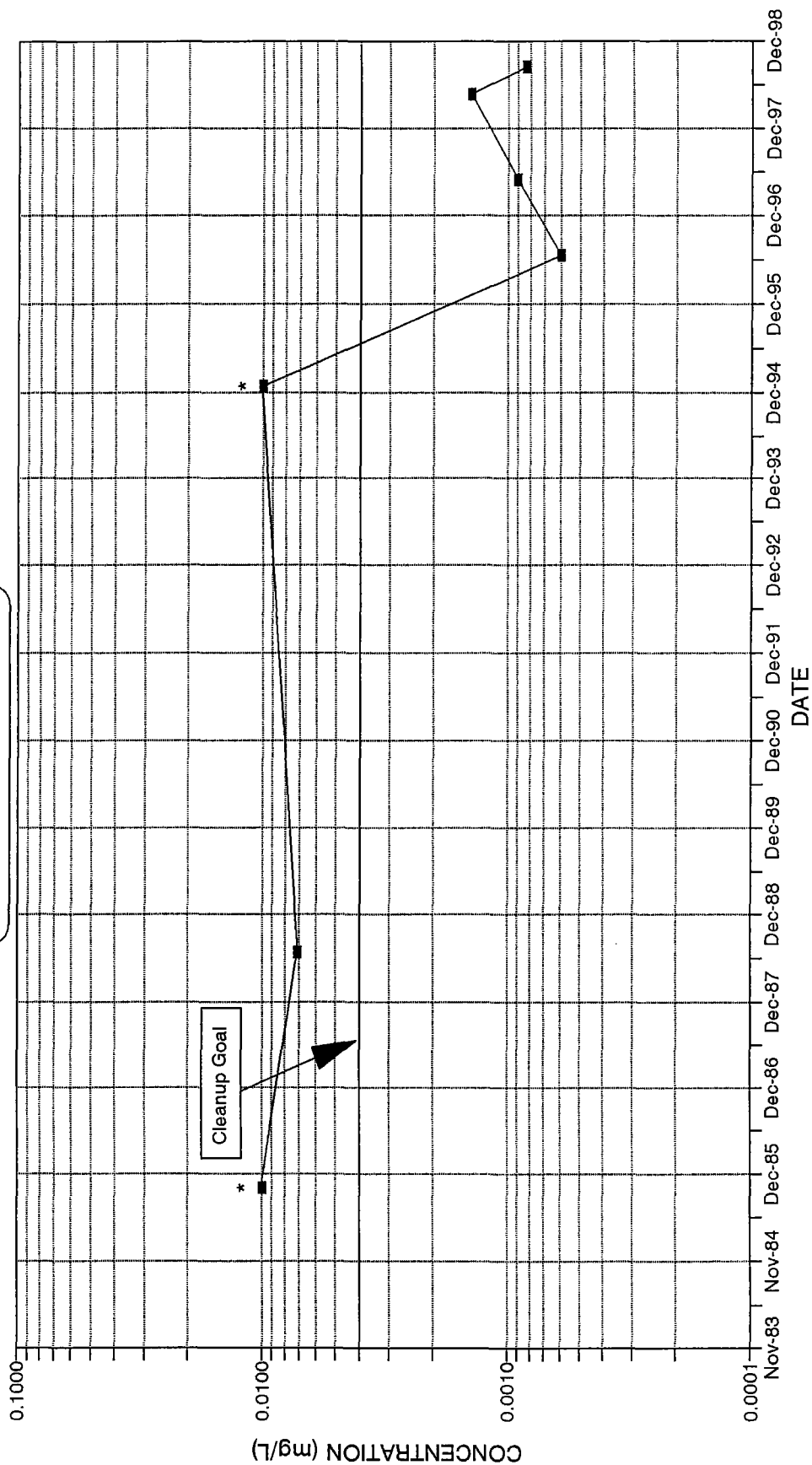
# BERYLLIUM VS. TIME MW-16



■ MW-16

\* = Value plotted is detection limit

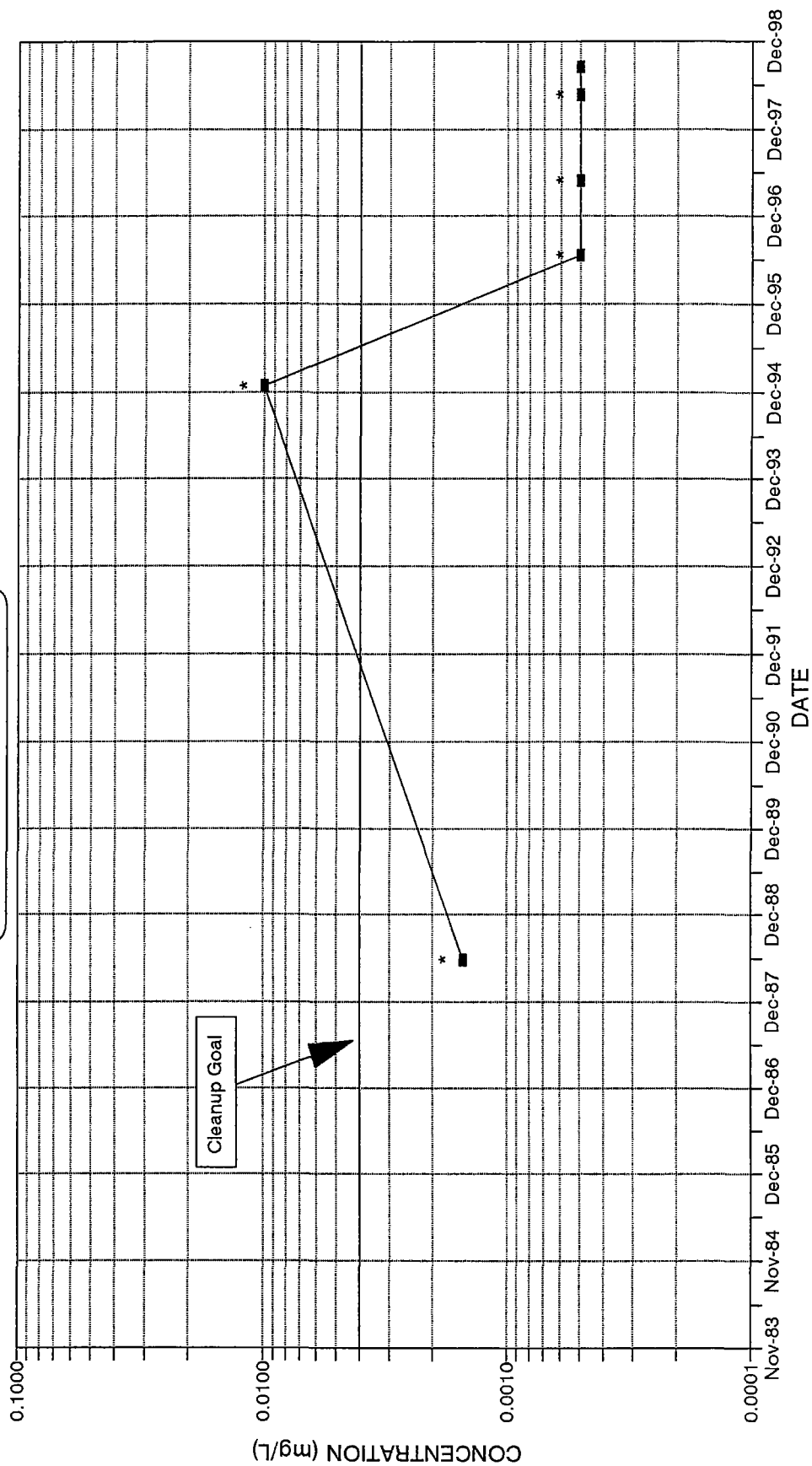
# BERYLLIUM VS. TIME MW-18



■ MW-18

\* = Value plotted is detection limit

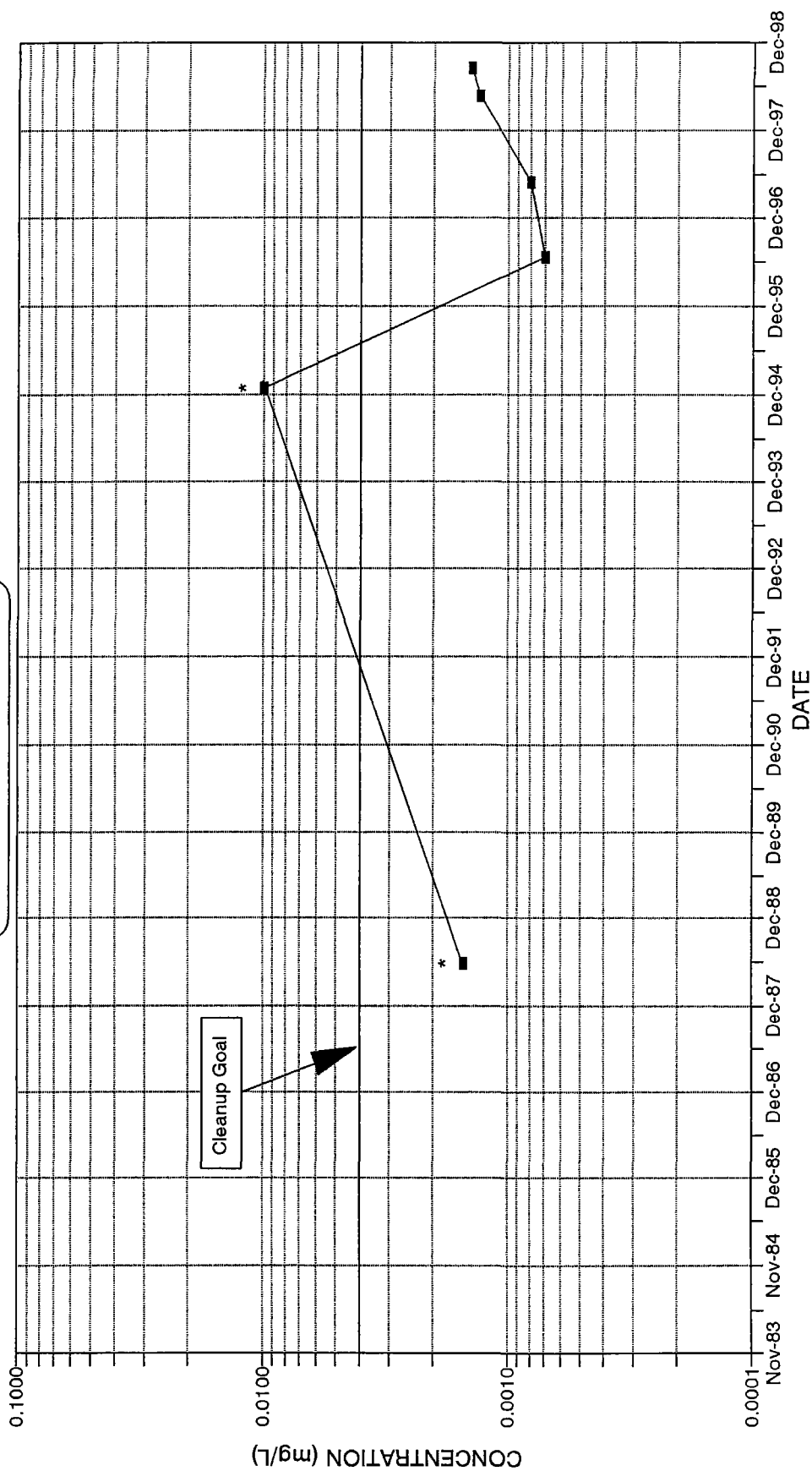
**BERYLLIUM VS. TIME**  
**MW-28**



■ MW-28

\* = Value plotted is detection limit

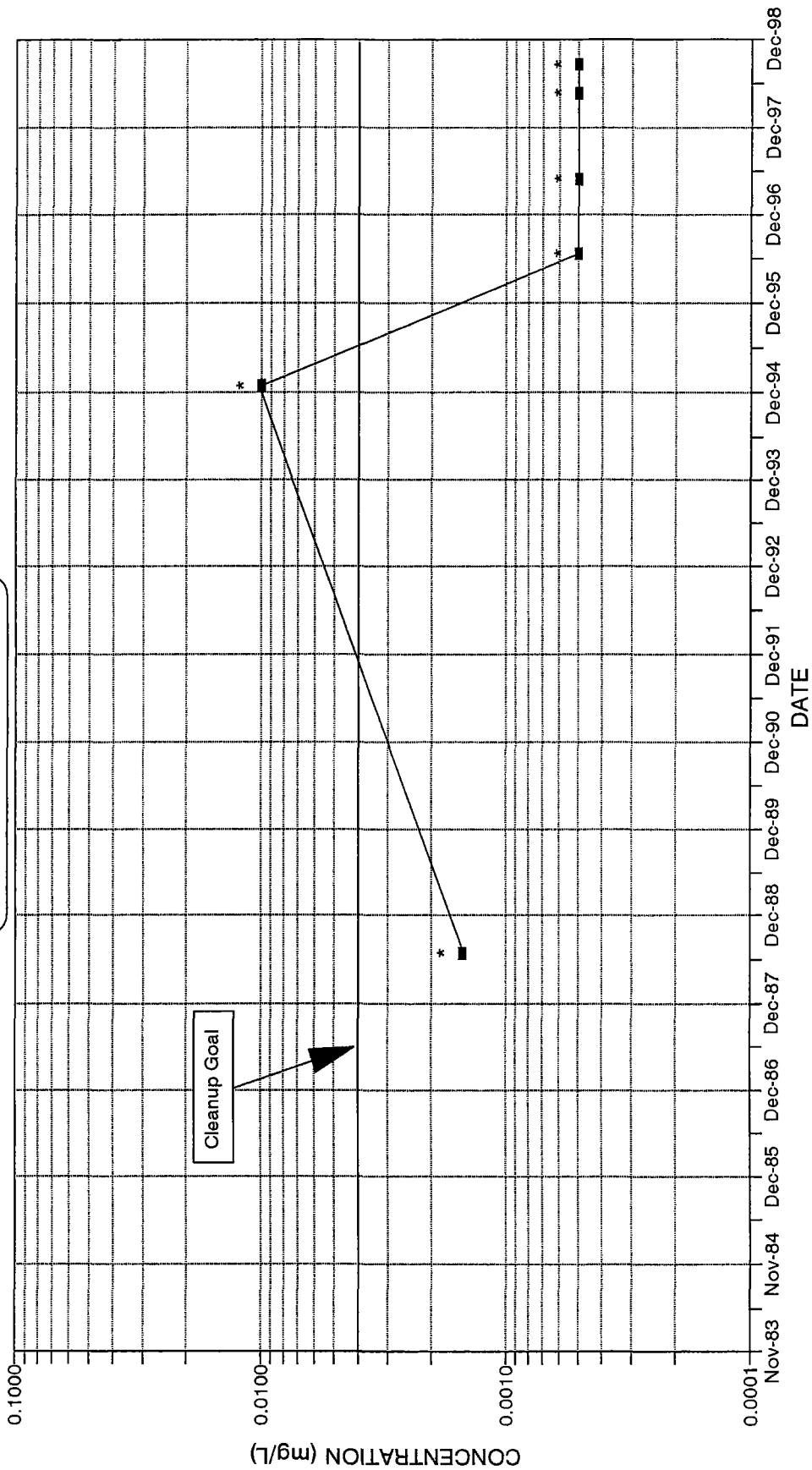
# BERYLLIUM VS. TIME MW-31



\* = Value plotted is detection limit

MW-31

**BERYLLIUM VS. TIME**  
**MW-32**

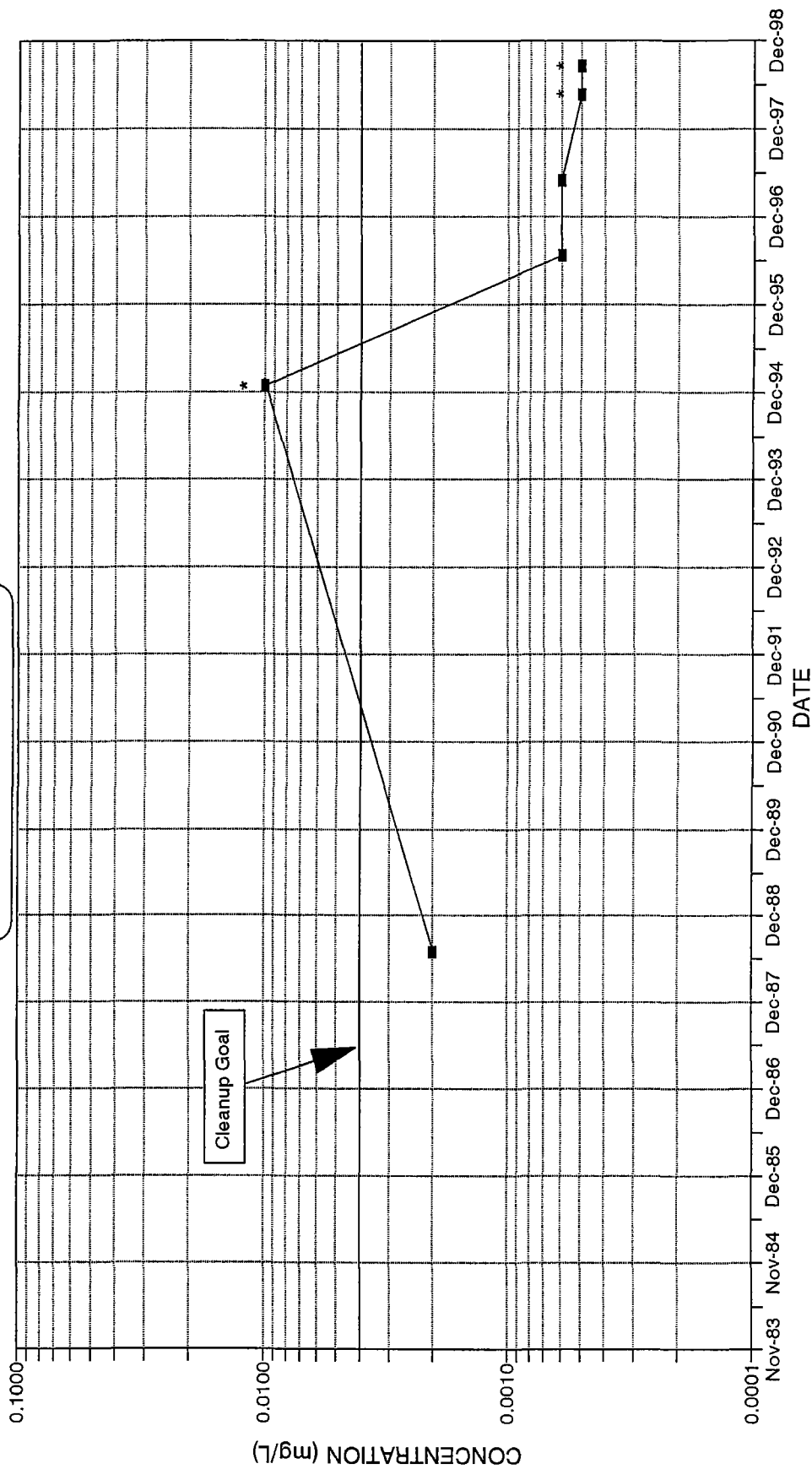


■ MW-32

\* = Value plotted is detection limit



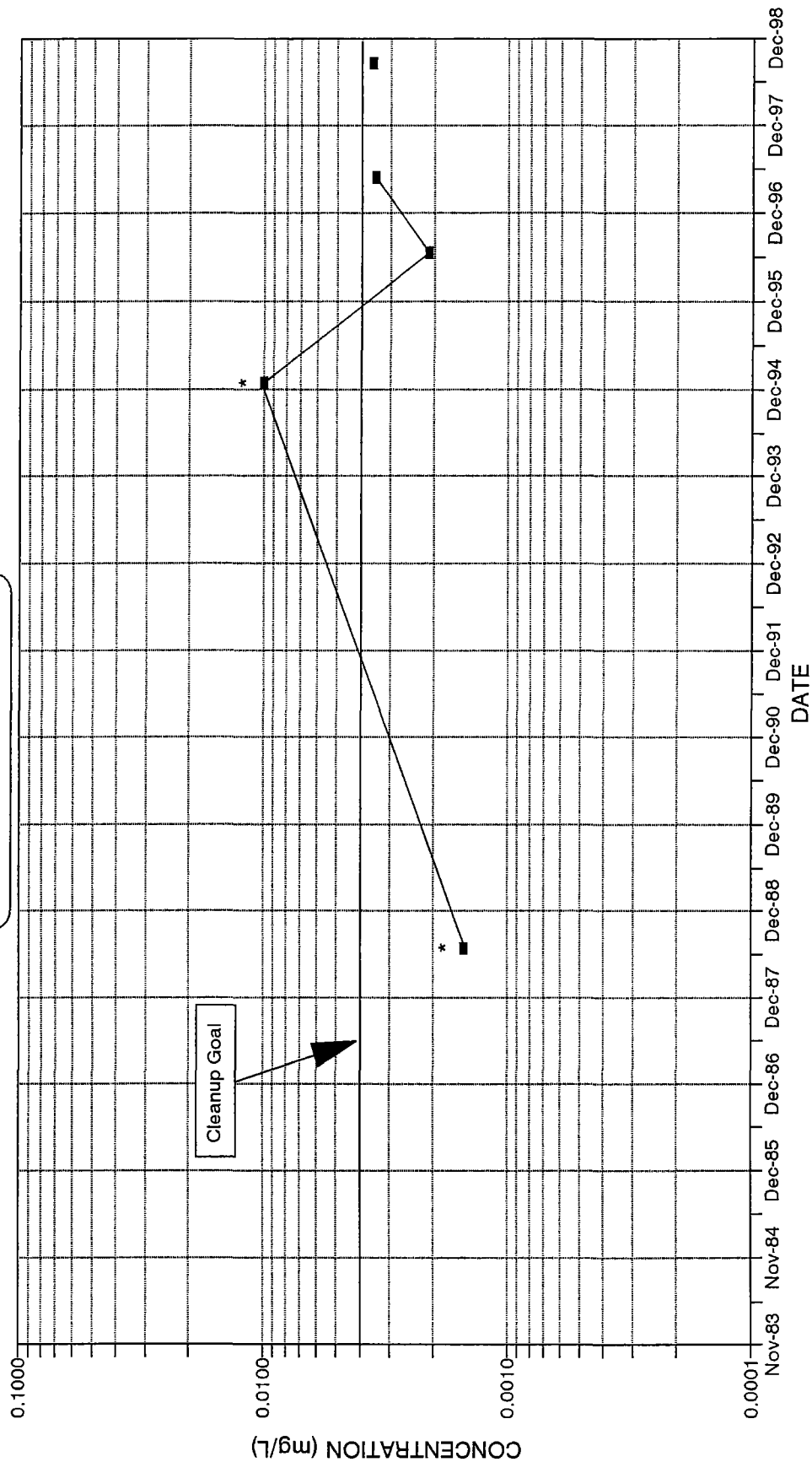
# BERYLLIUM VS. TIME MW-35



\* = Value plotted is detection limit

■ MW-35

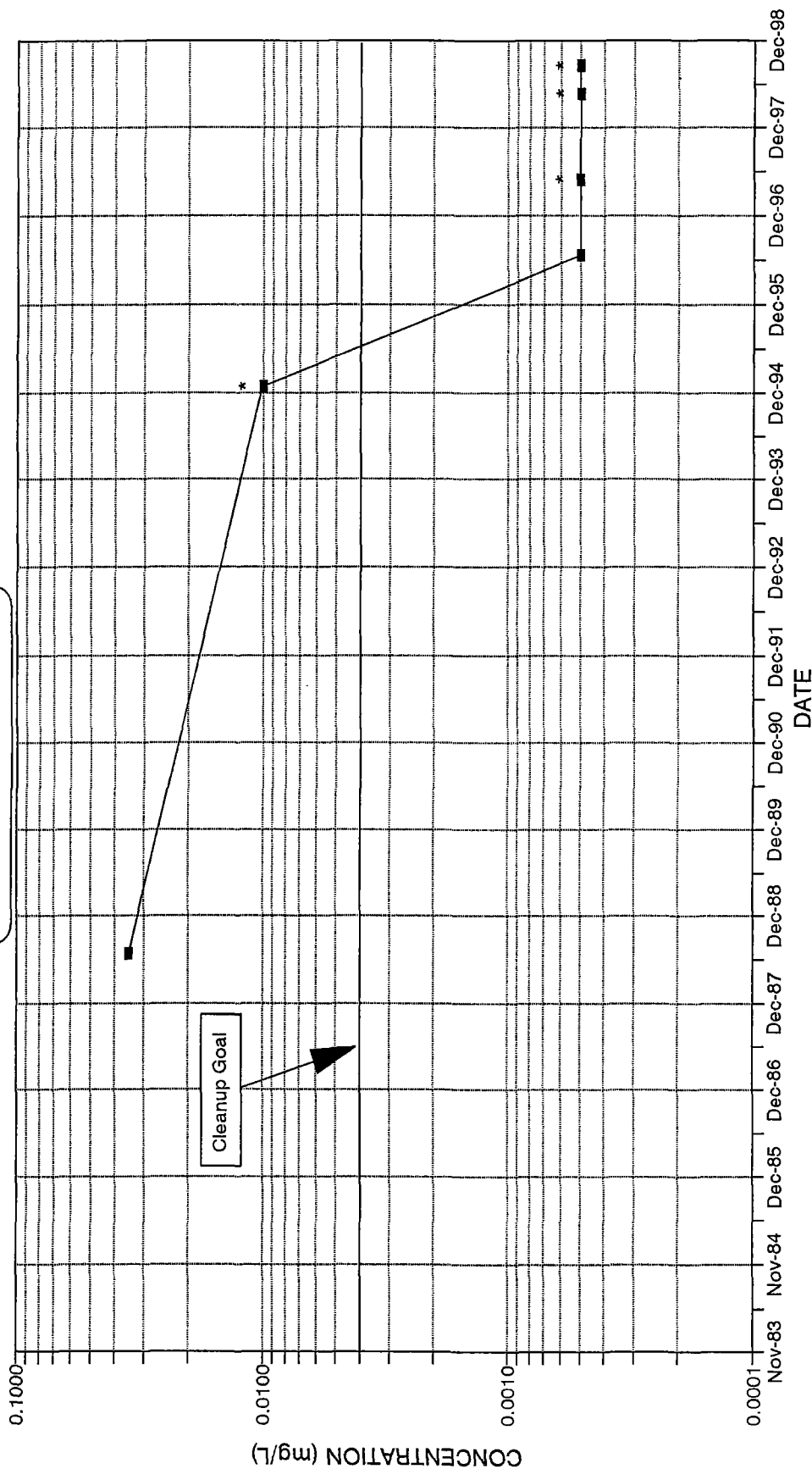
BERYLLIUM VS. TIME  
MW-36



\* = Value plotted is detection limit

■ MW-36

# BERYLLIUM VS. TIME MW-37



\* = Value plotted is detection limit

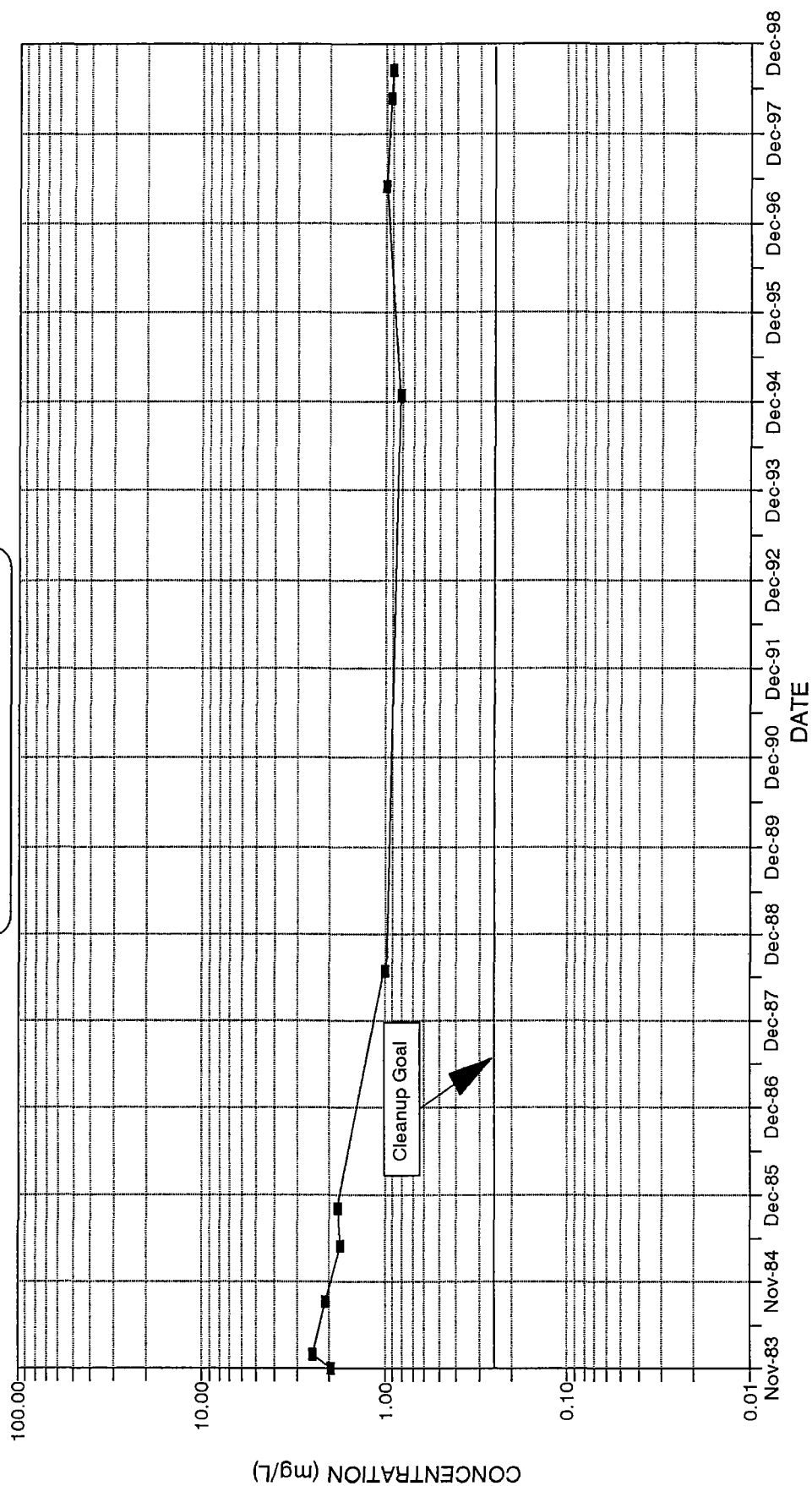
■ MW-37



## APPENDIX D-5

### MANGANESE

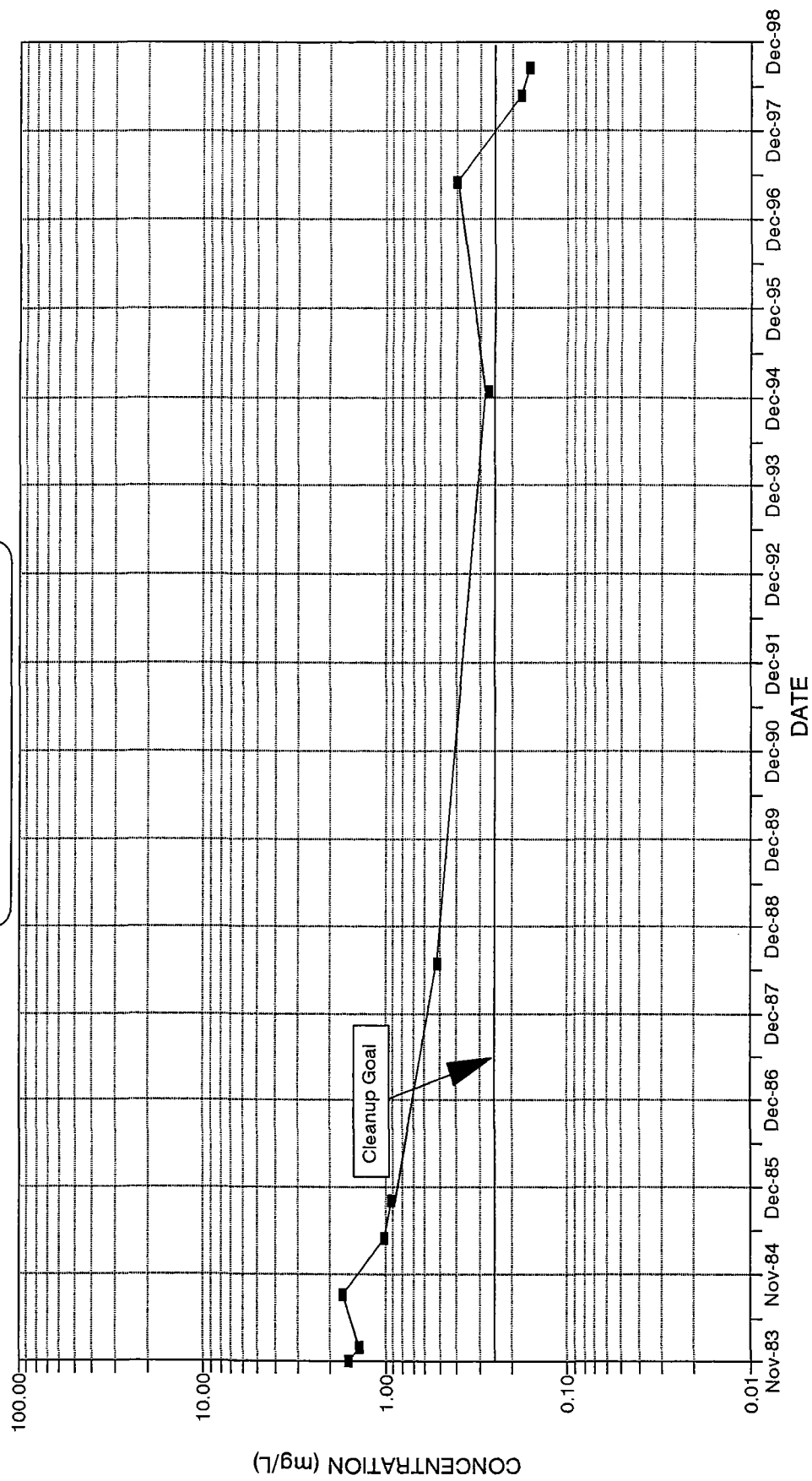
MANGANESE VS. TIME  
MW-2



■ MW-2

\* = Value plotted is detection limit

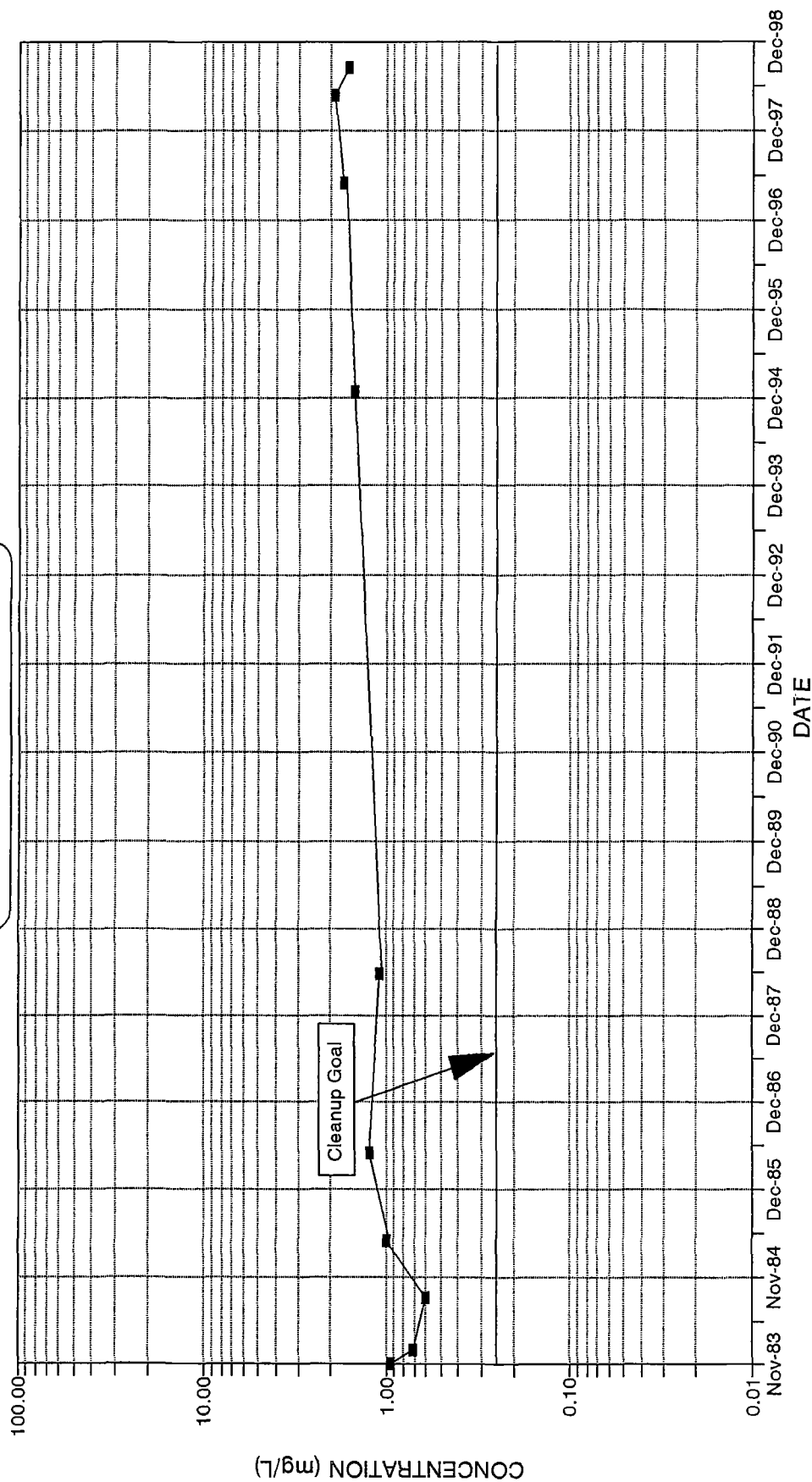
MANGANESE VS. TIME  
MW-5



■ MW-5

\* = Value plotted is detection limit

MANGANESE VS. TIME  
MW-12

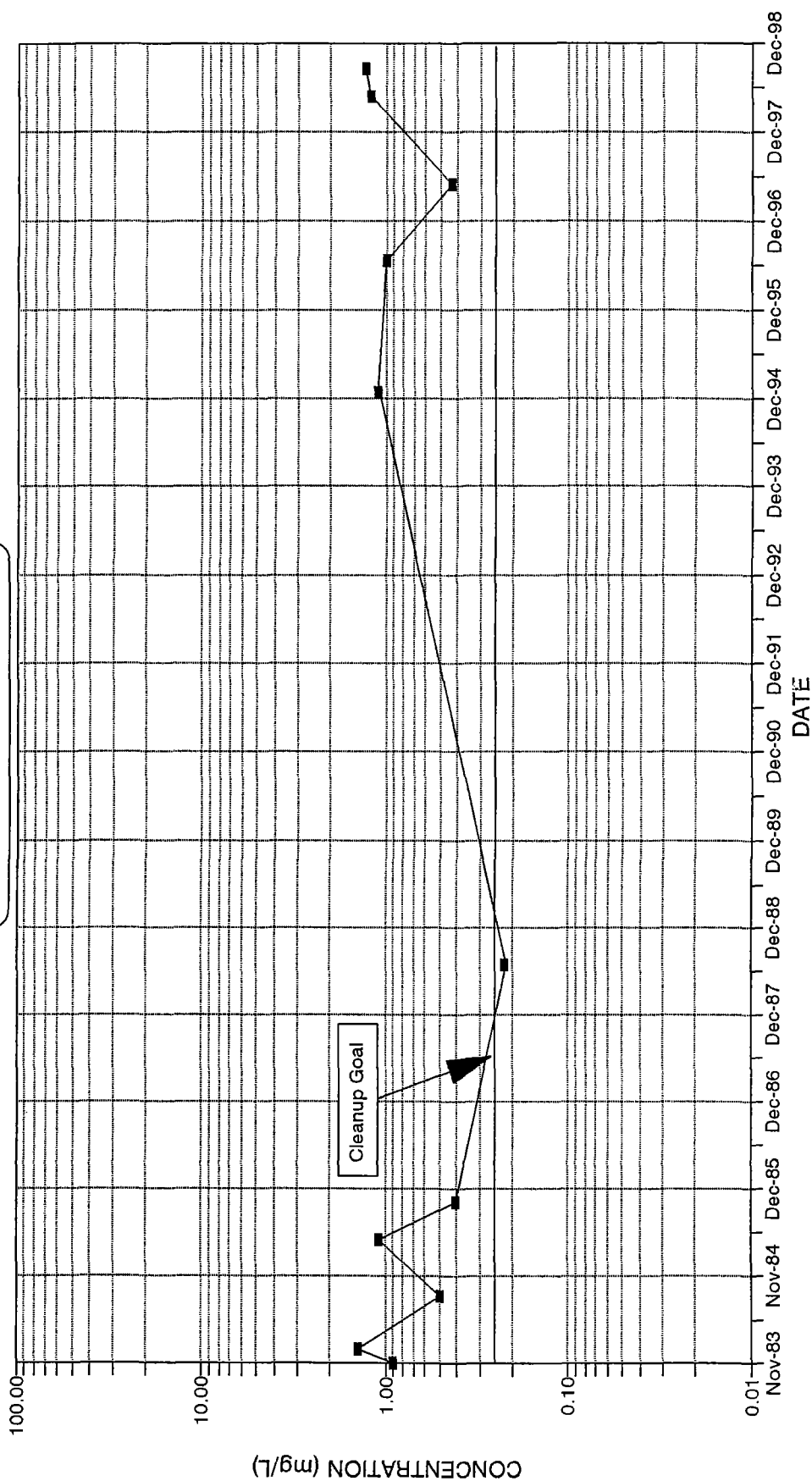


\* = Value plotted is detection limit

■ MW-12



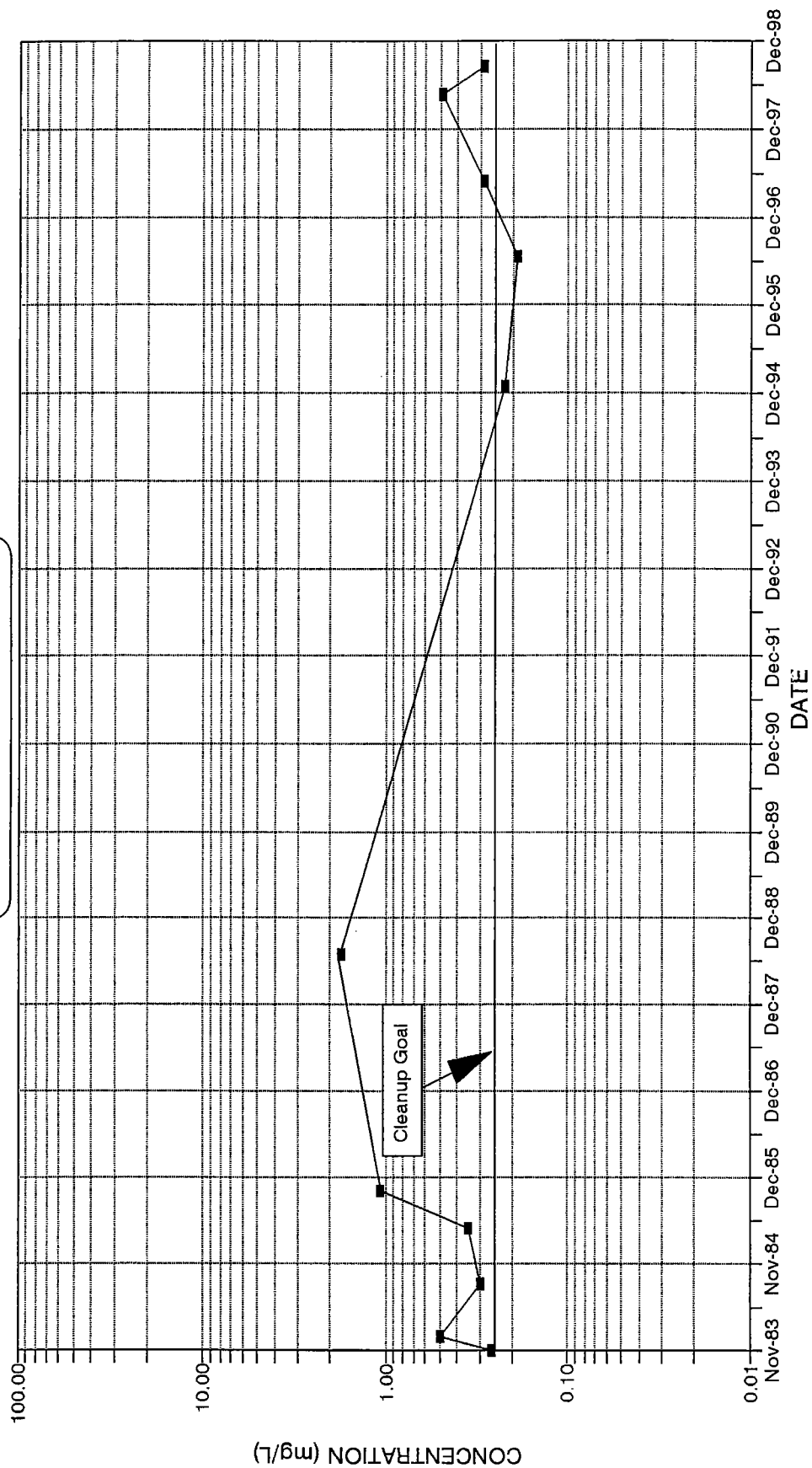
# MANGANESE VS. TIME MW-16



\* = Value plotted is detection limit

■ MW-16

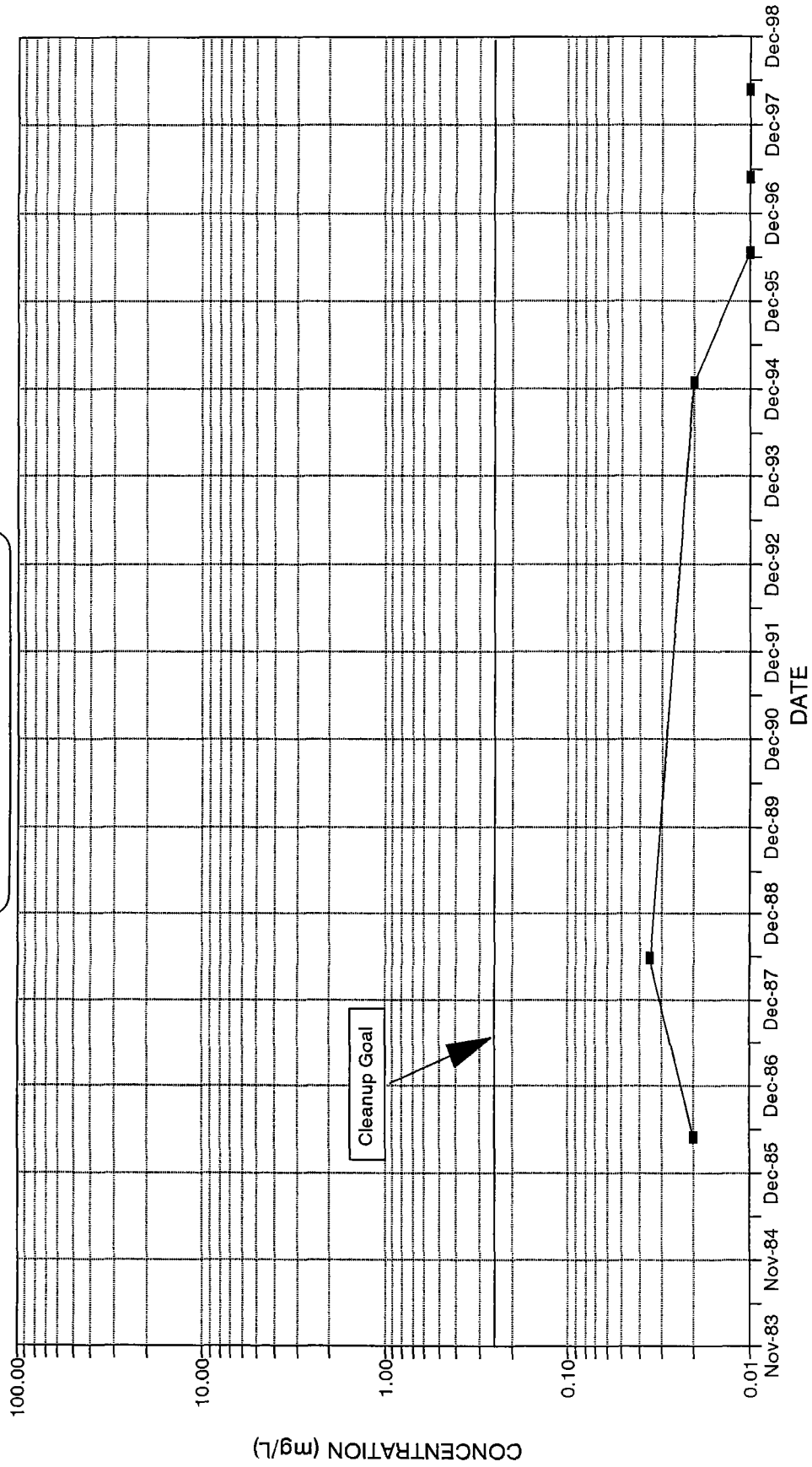
# MANGANESE VS. TIME MW-18



\* = Value plotted is detection limit

■ MW-18

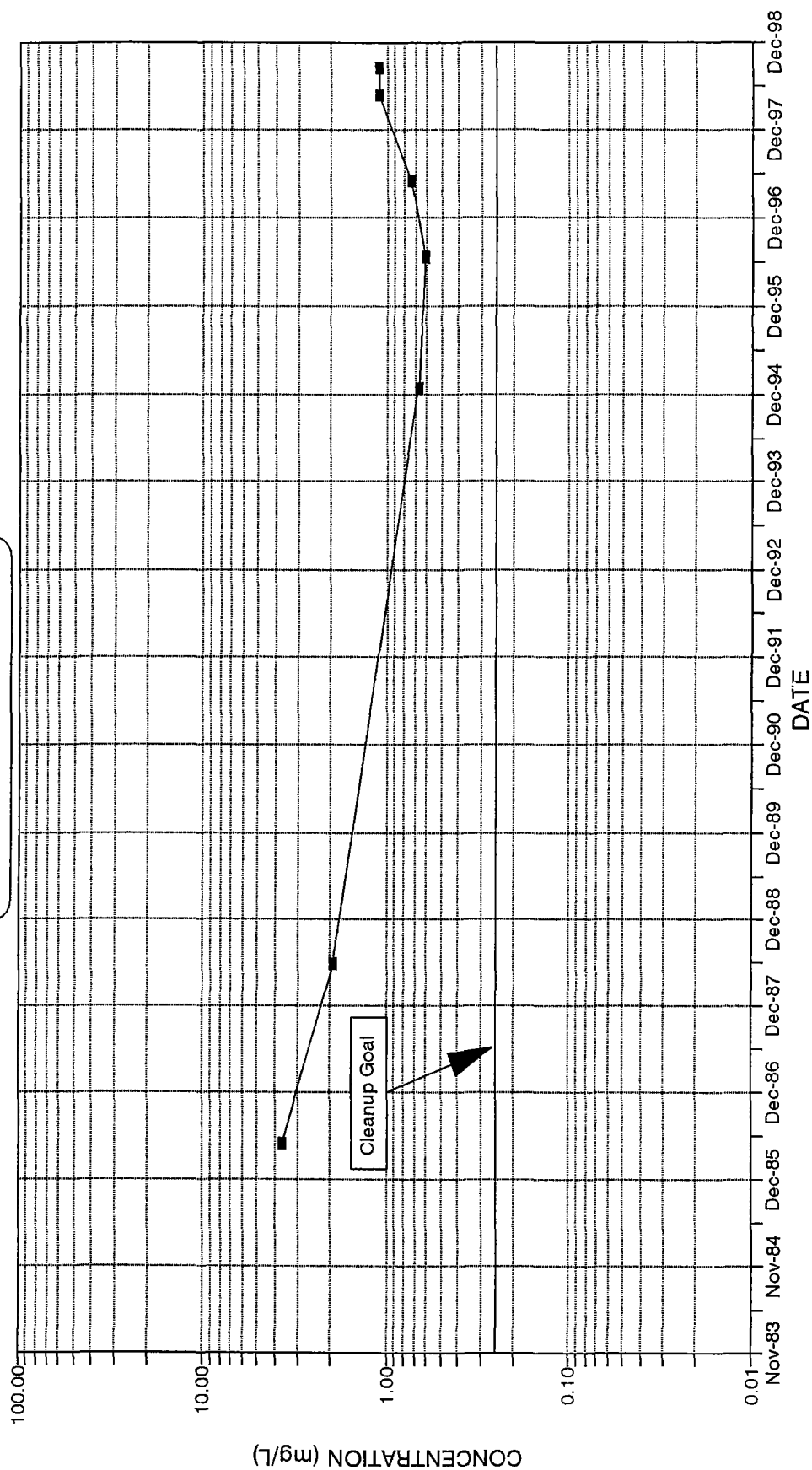
# MANGANESE VS. TIME MW-28



■ MW-28

\* = Value plotted is detection limit

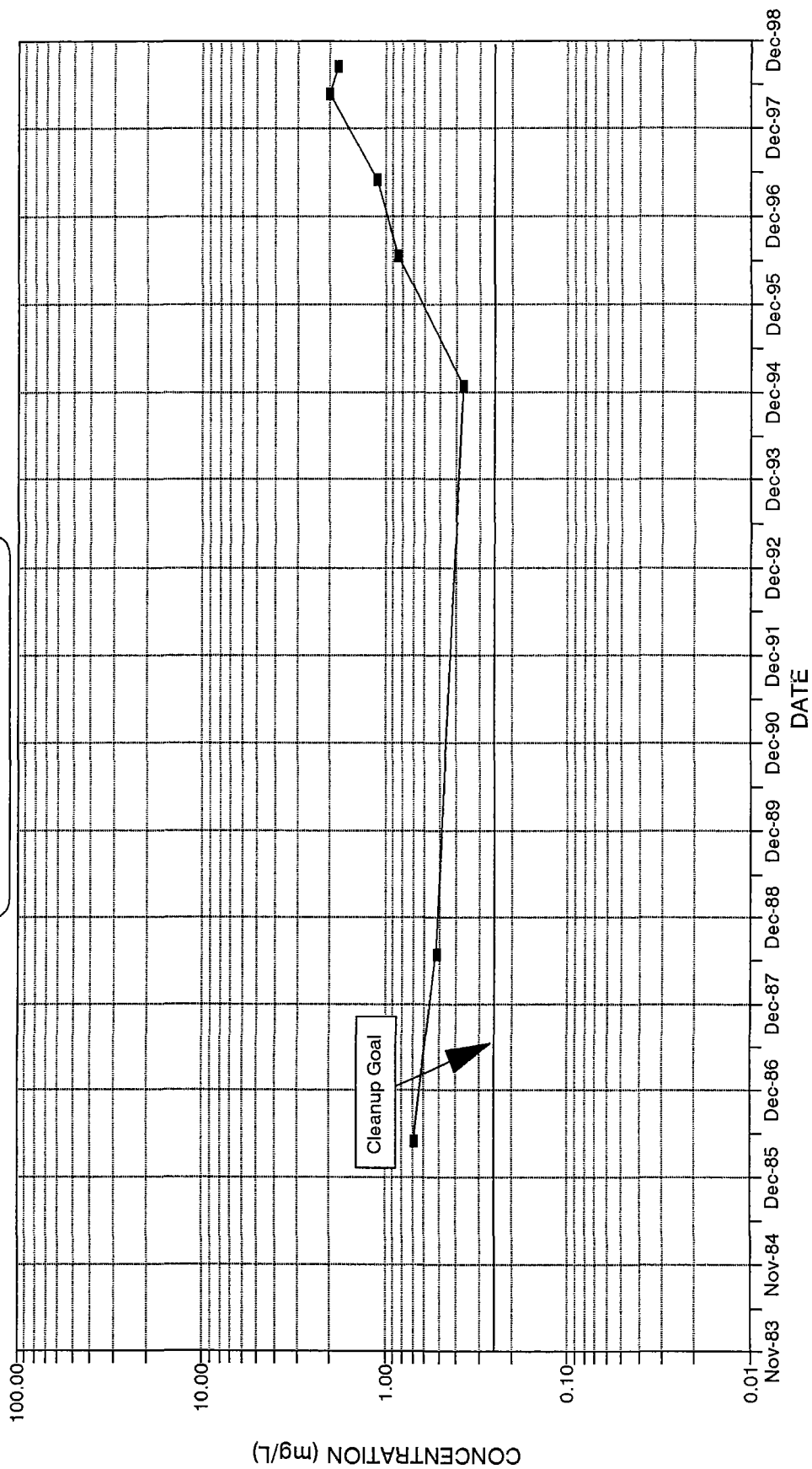
# MANGANESE VS. TIME MW-31



\* = Value plotted is detection limit

■ MW-31

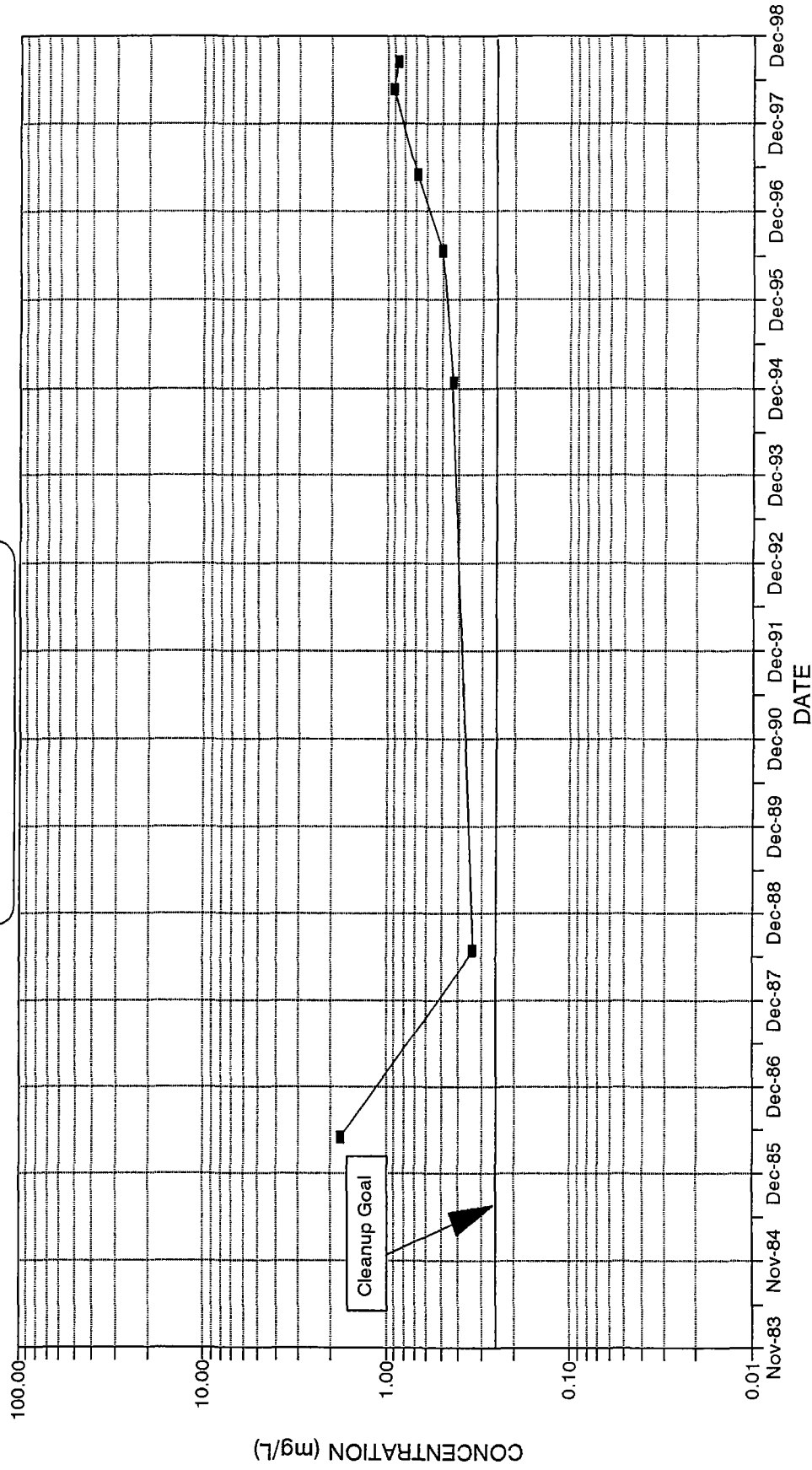
MANGANESE VS. TIME  
MW-32



■ MW-32

\* = Value plotted is detection limit

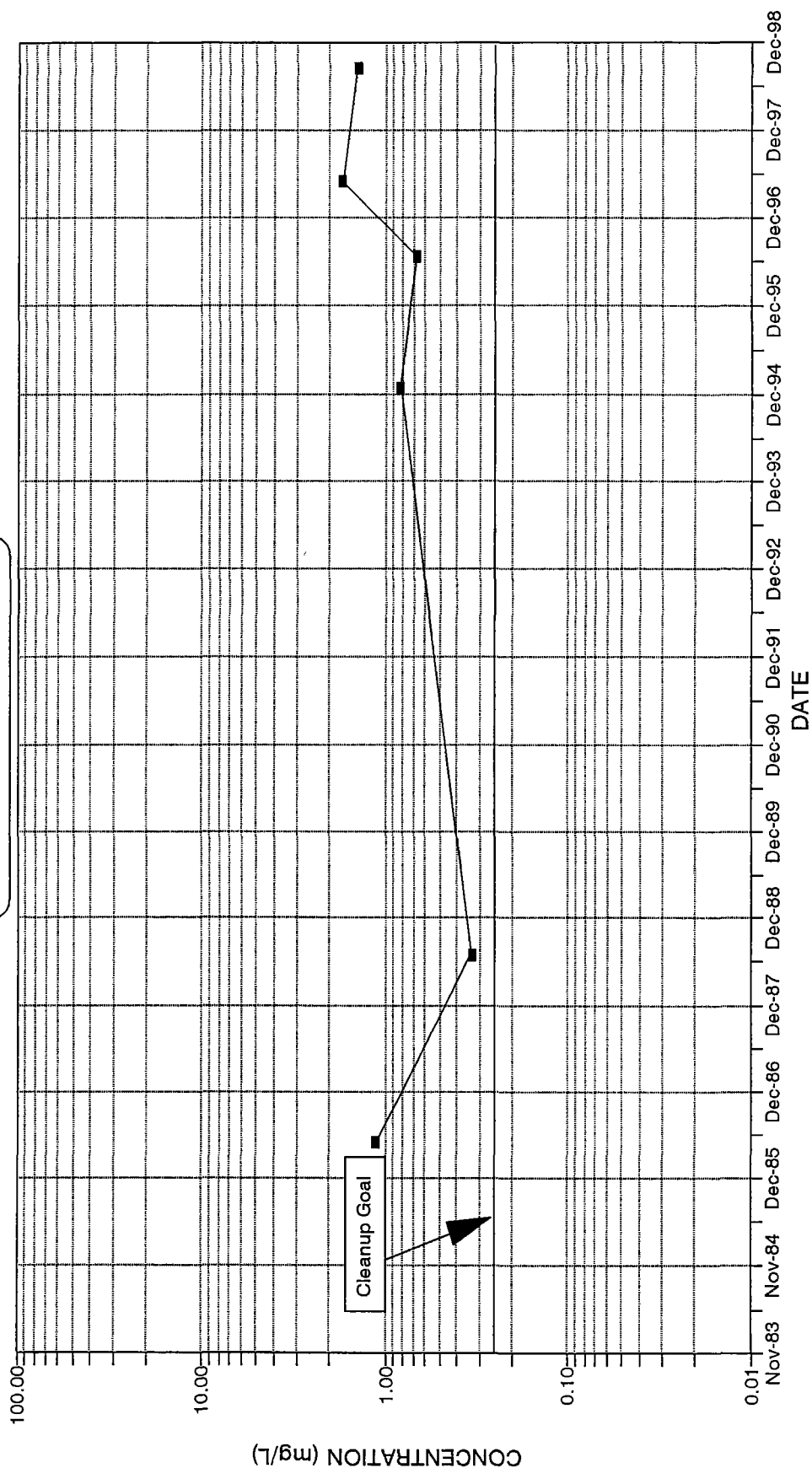
# MANGANESE VS. TIME MW-35



■ MW-35

\* = Value plotted is detection limit

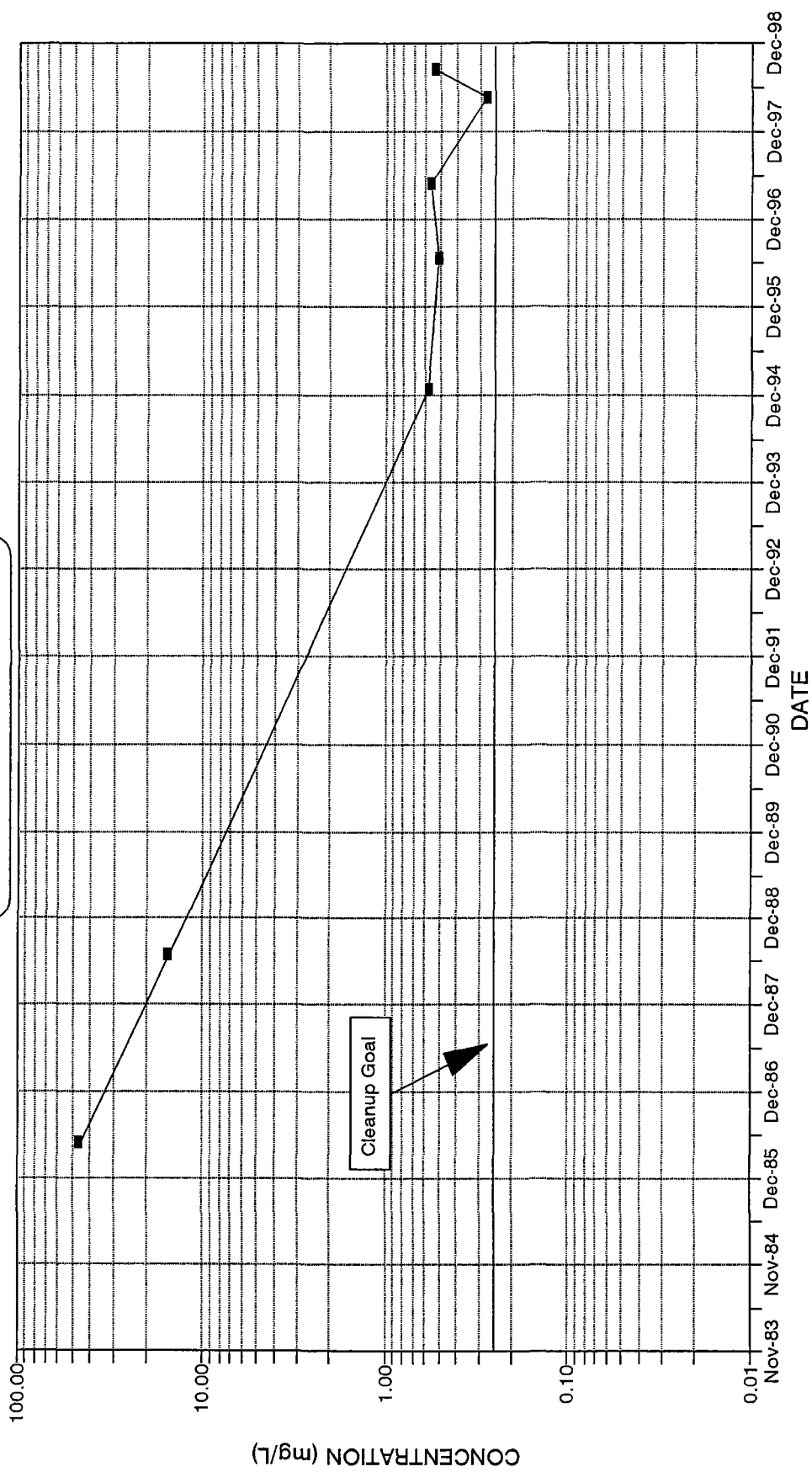
# MANGANESE VS. TIME MW-36



■ MW-36

\* = Value plotted is detection limit

MANGANESE VS. TIME  
MW-37



■ MW-37

\* = Value plotted is detection limit

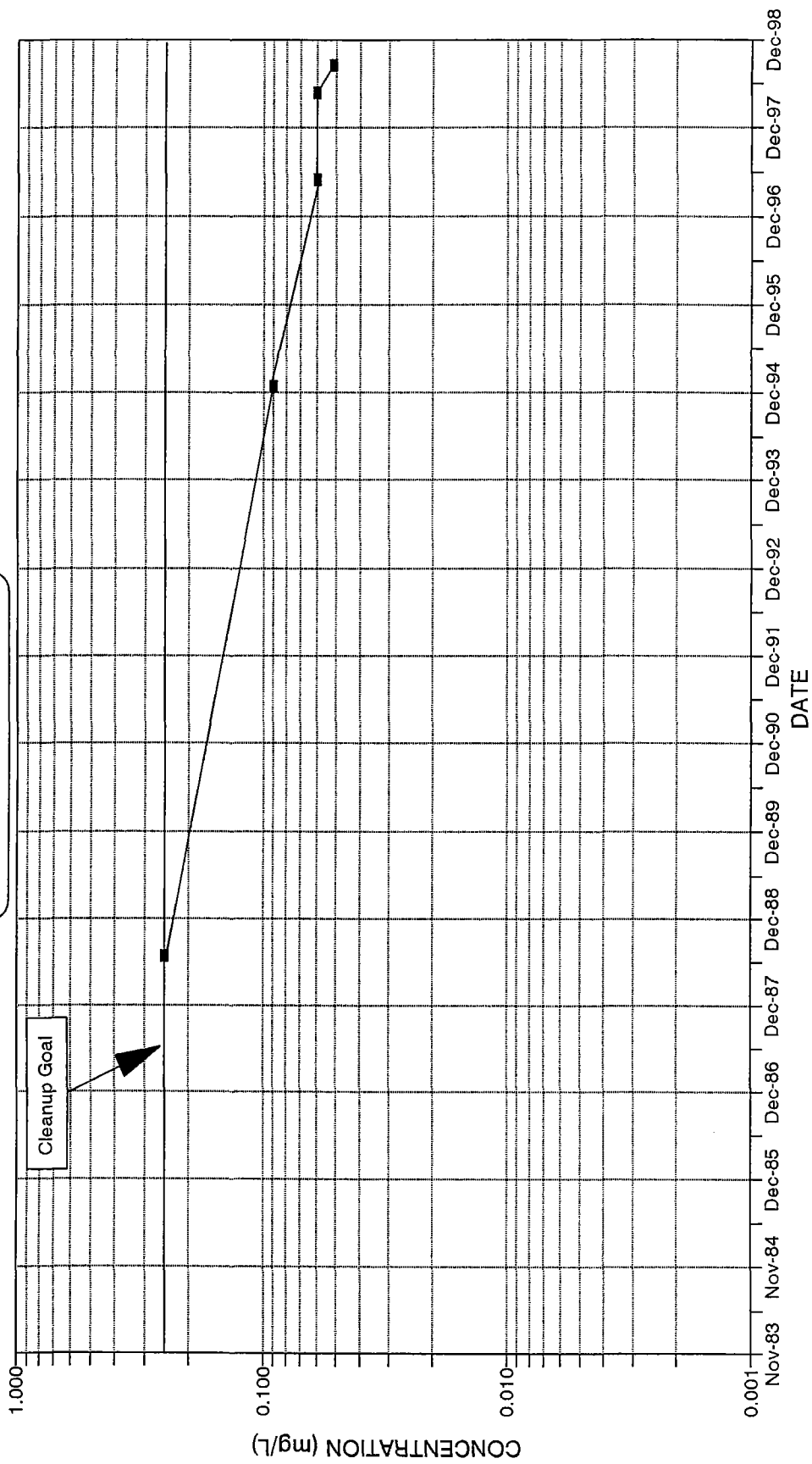




## APPENDIX D-6

### VANADIUM

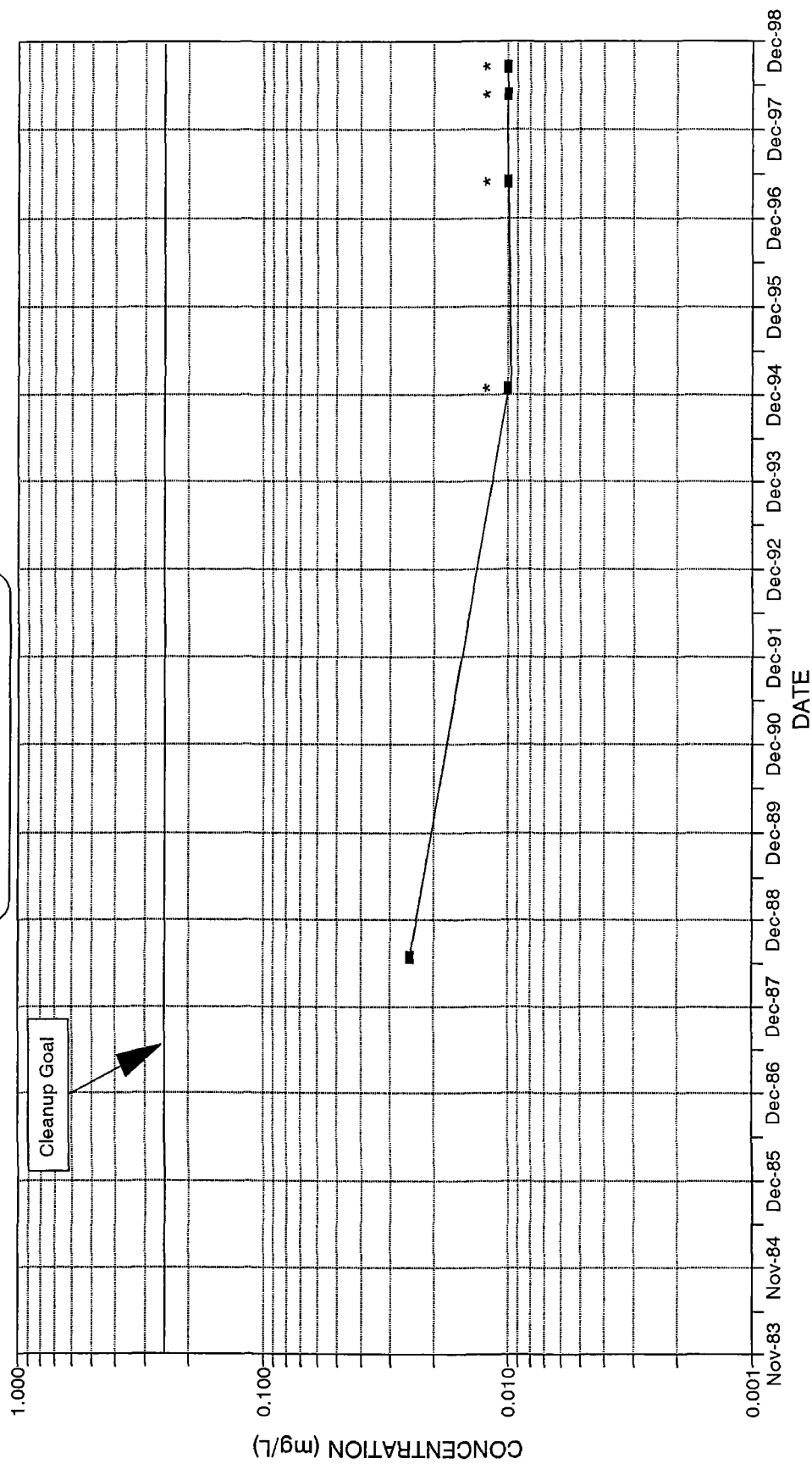
# VANADIUM VS. TIME MW-2



\* = Value plotted is detection limit

■ MW-2

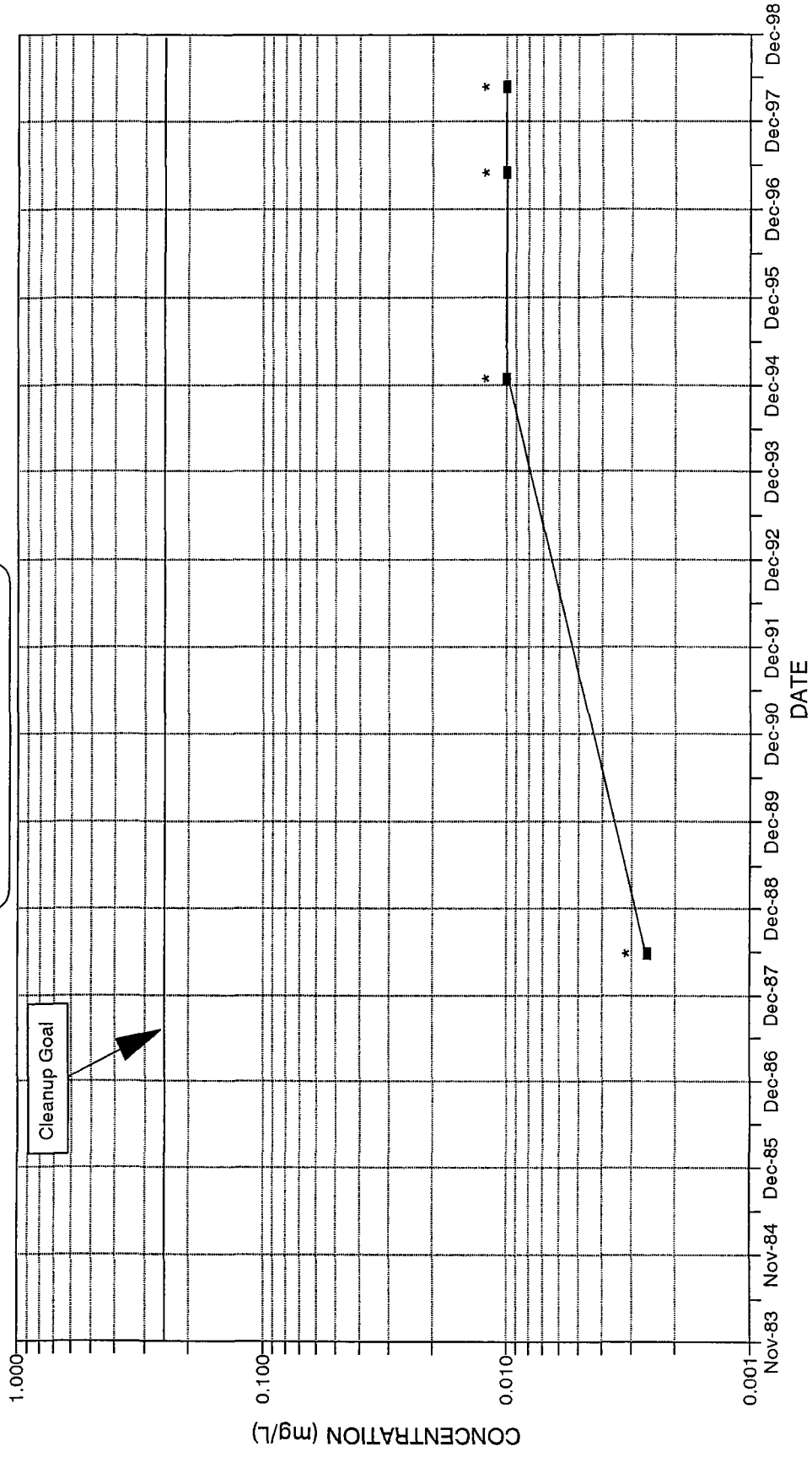
# VANADIUM VS. TIME MW-5



\* = Value plotted is detection limit

■ MW-5

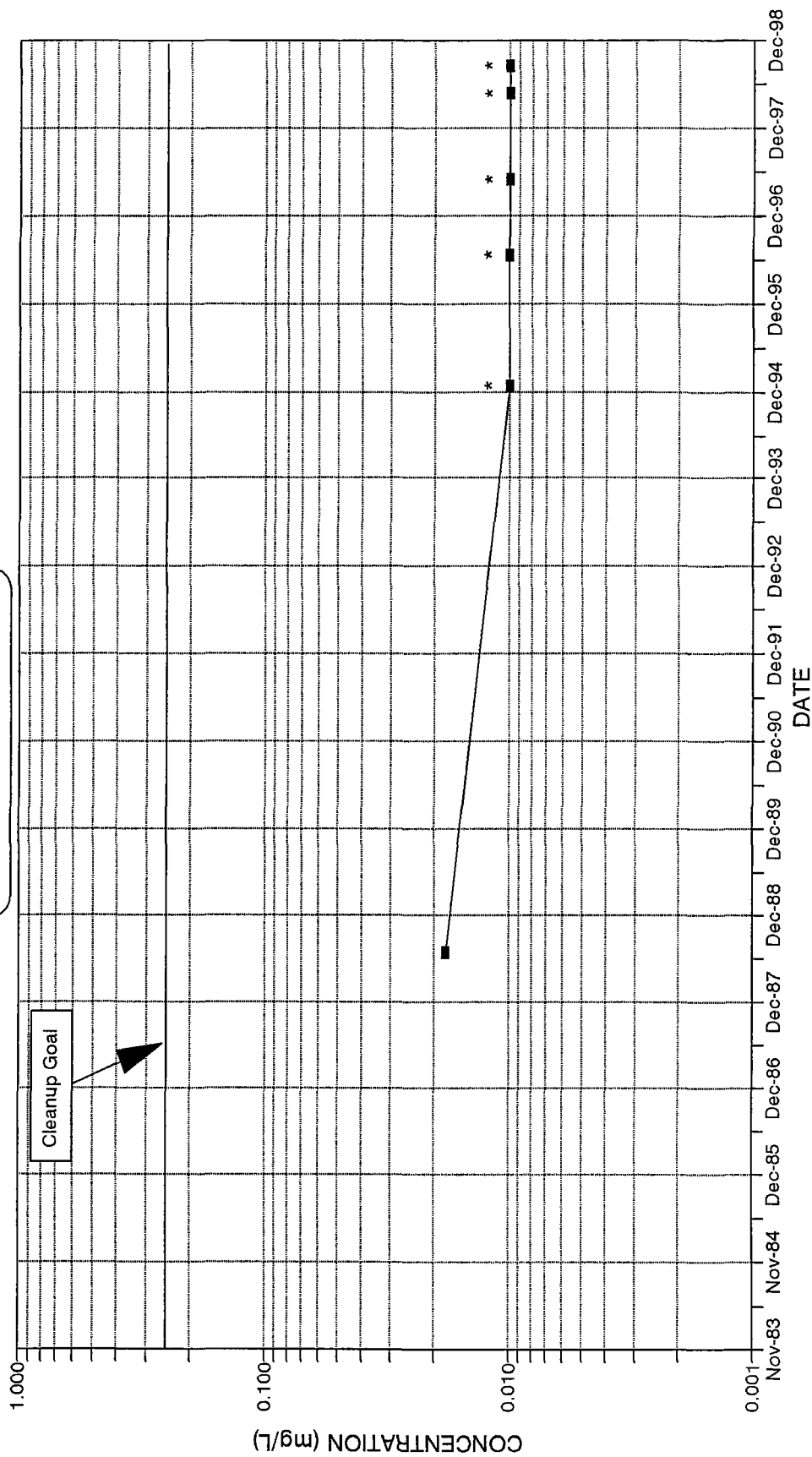
# VANADIUM VS. TIME MW-12



\* = Value plotted is detection limit

■ MW-12

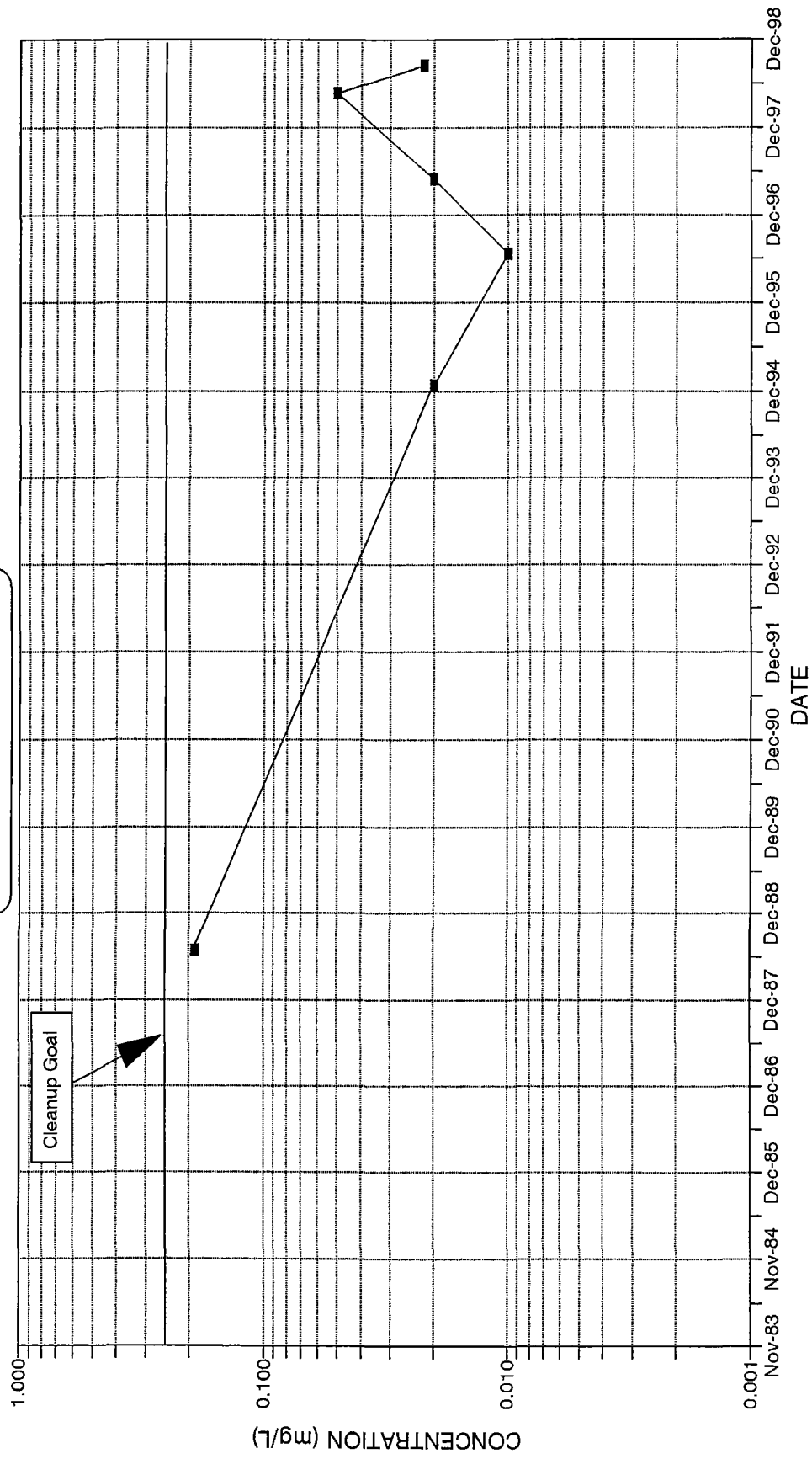
# VANADIUM VS. TIME MW-16



\* = Value plotted is detection limit

■ MW-16

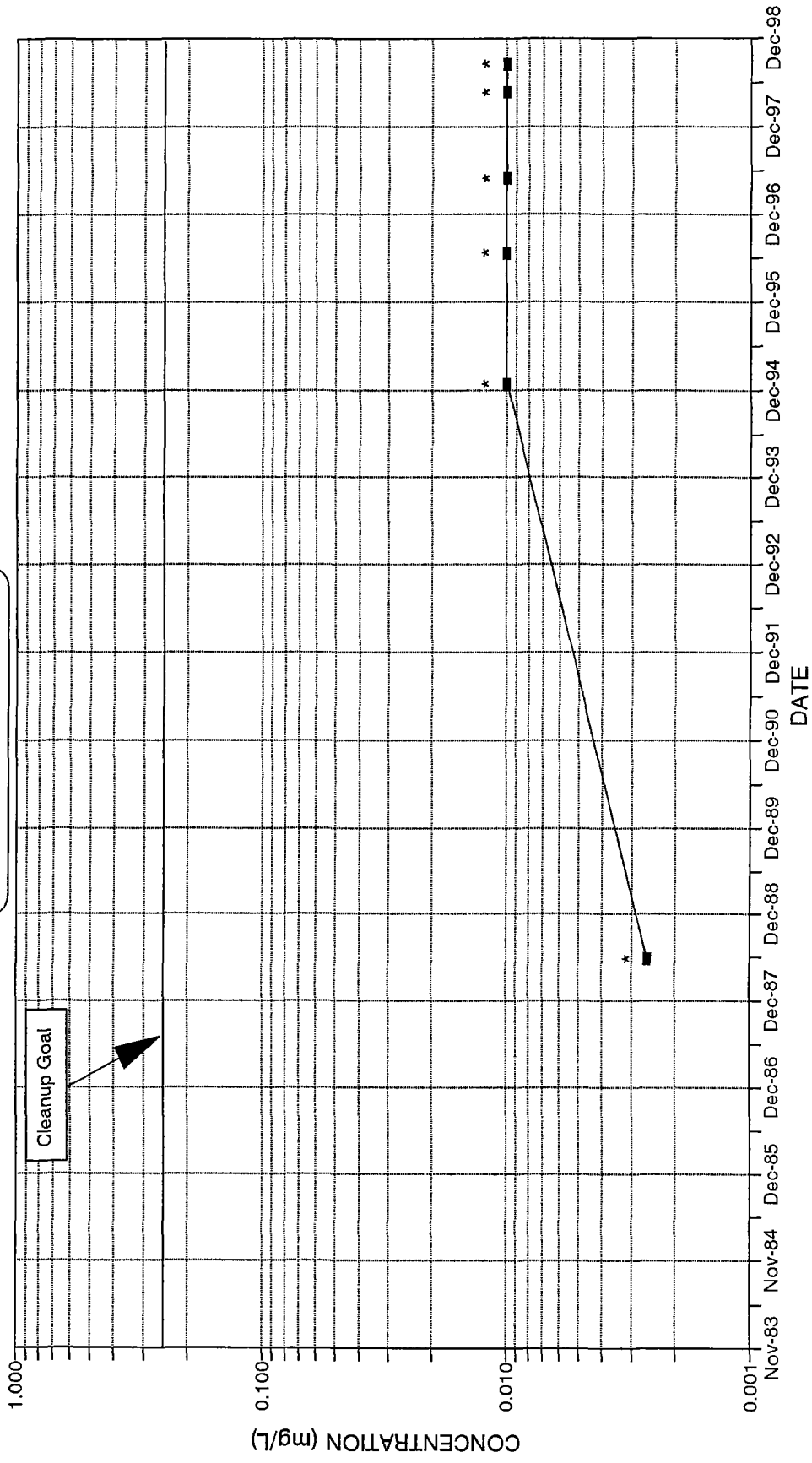
# VANADIUM VS. TIME MW-18



■ MW-18

\* = Value plotted is detection limit

# VANADIUM VS. TIME MW-28

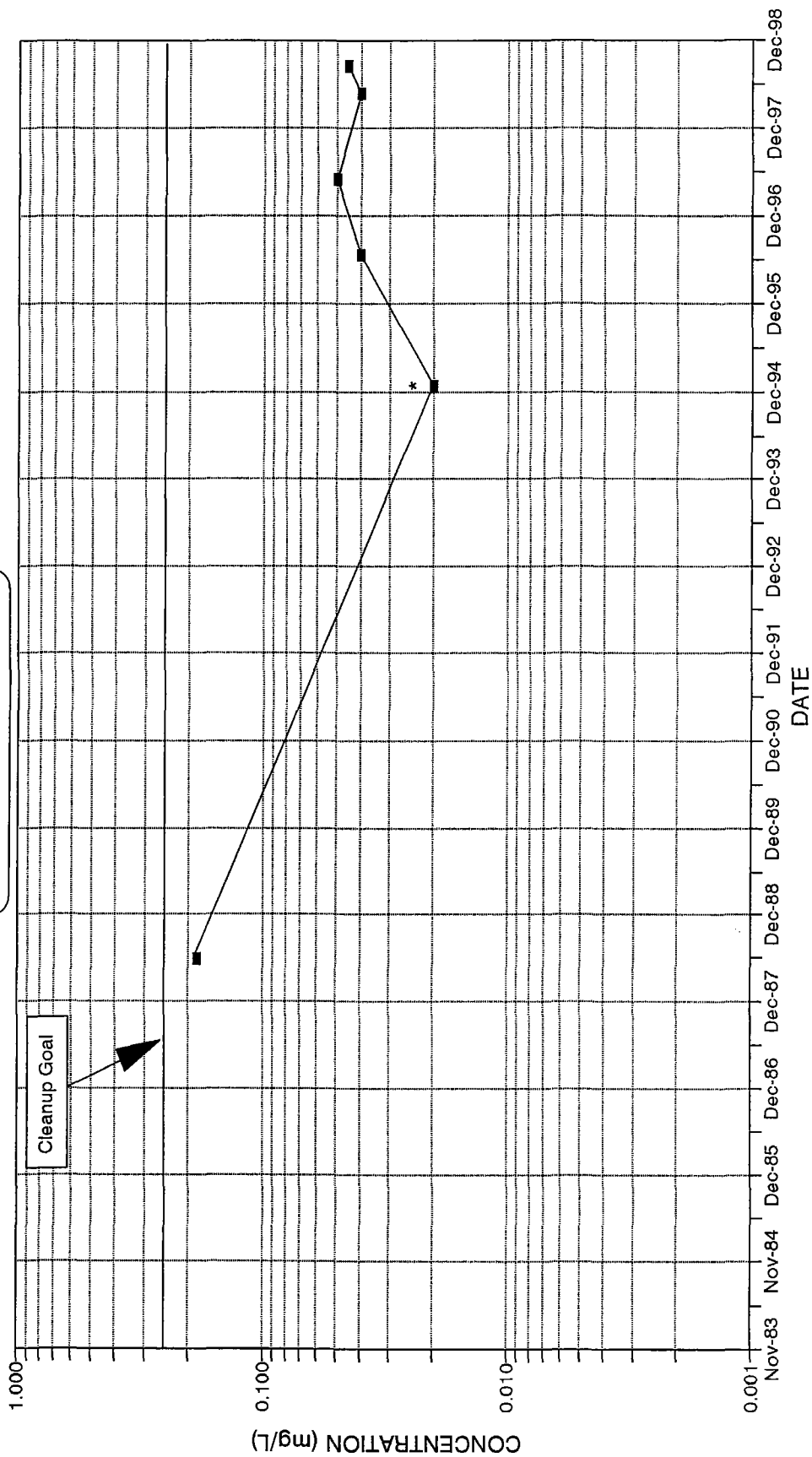


\* = Value plotted is detection limit

■ MW-28



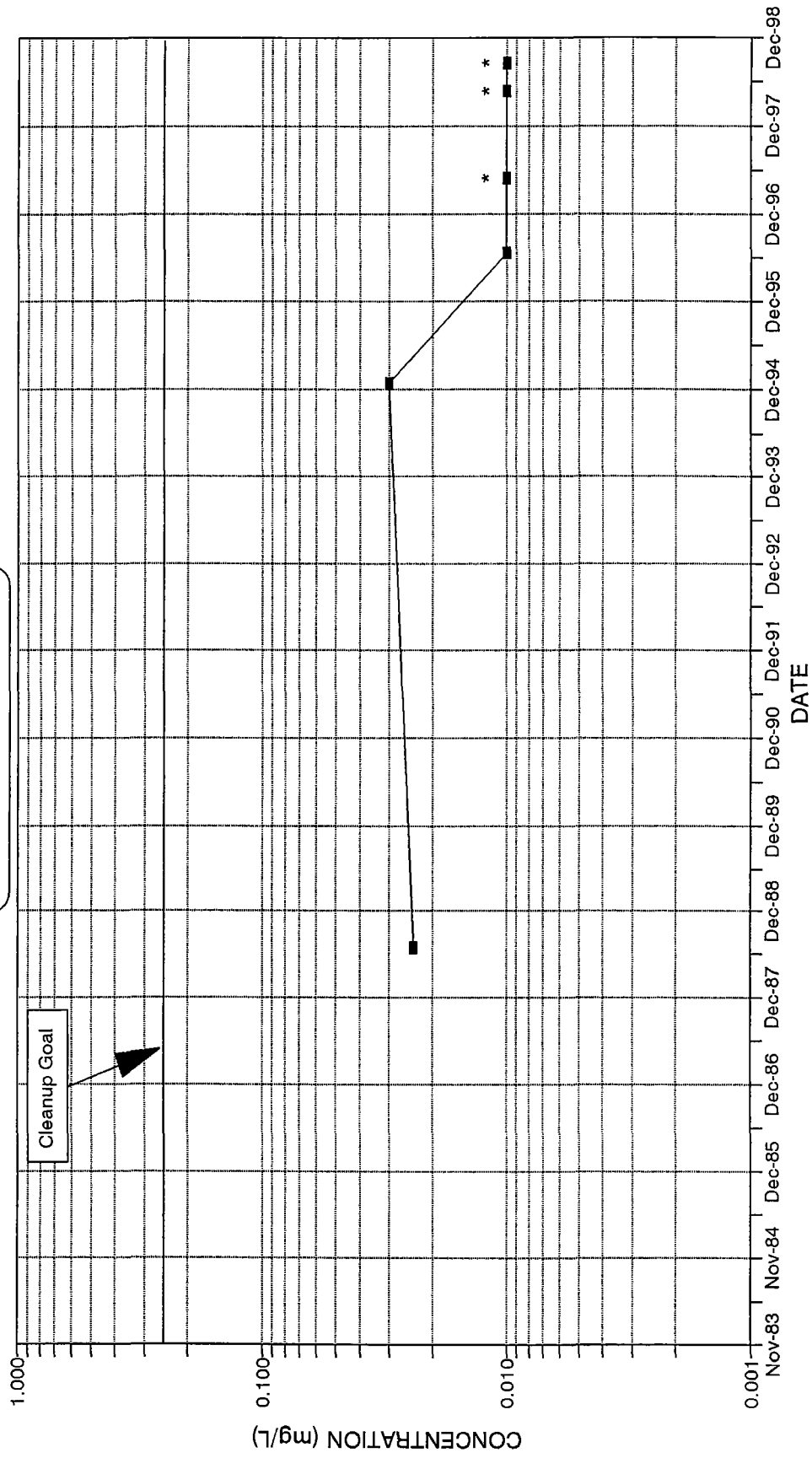
# VANADIUM VS. TIME MW-31



■ MW-31

\* = Value plotted is detection limit

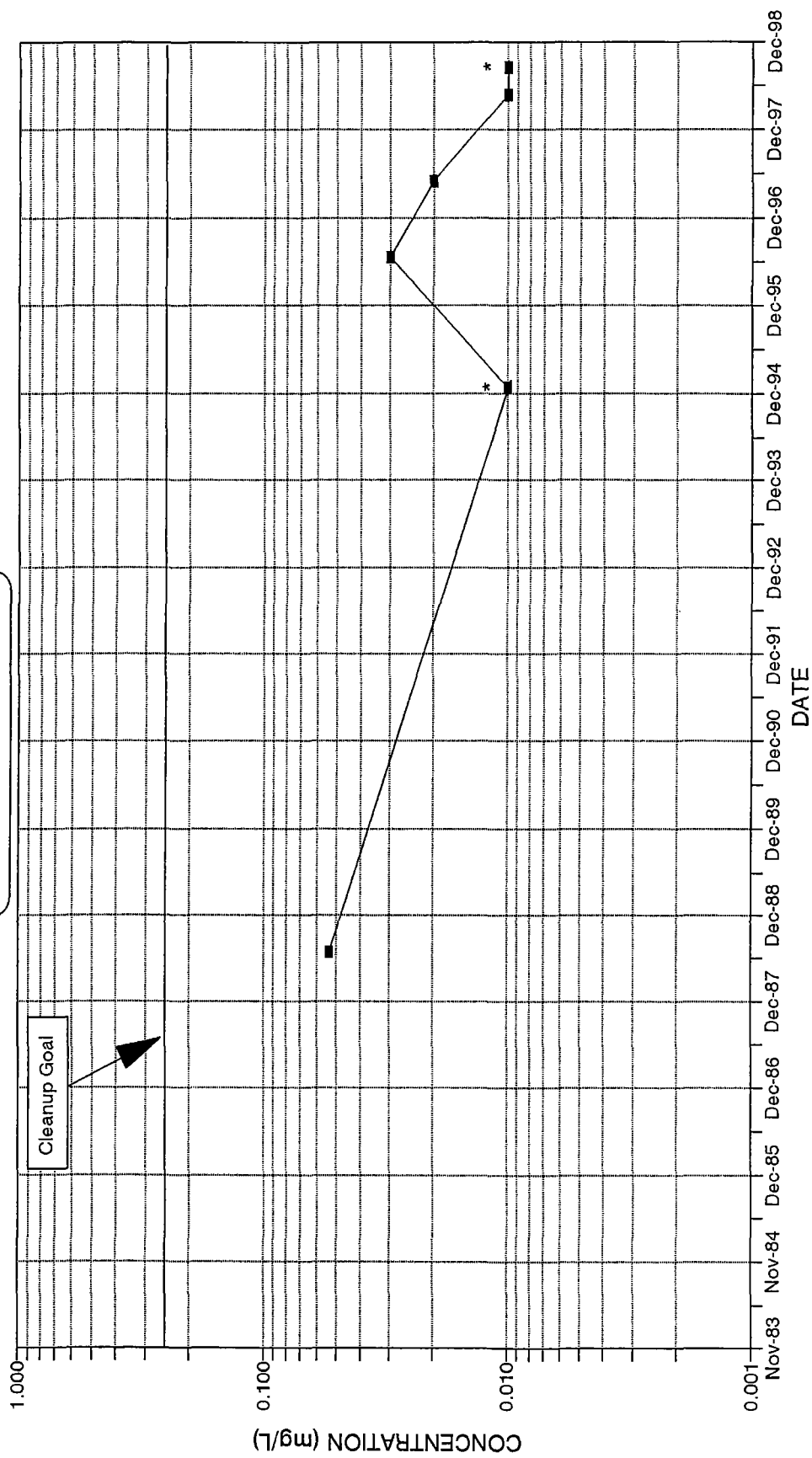
# VANADIUM VS. TIME MW-32



\* = Value plotted is detection limit

■ MW-32

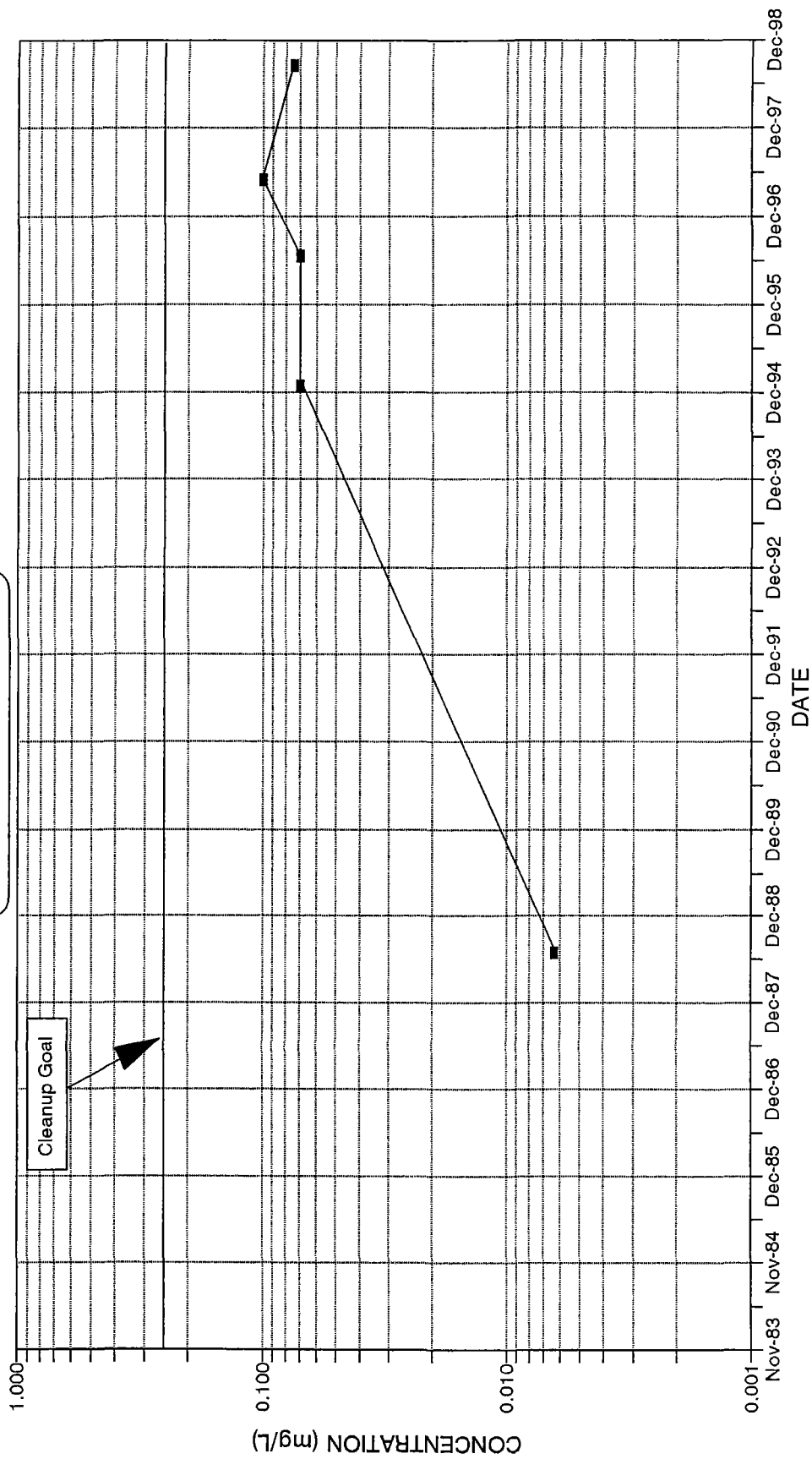
# VANADIUM VS. TIME MW-35



\* = Value plotted is detection limit

■ MW-35

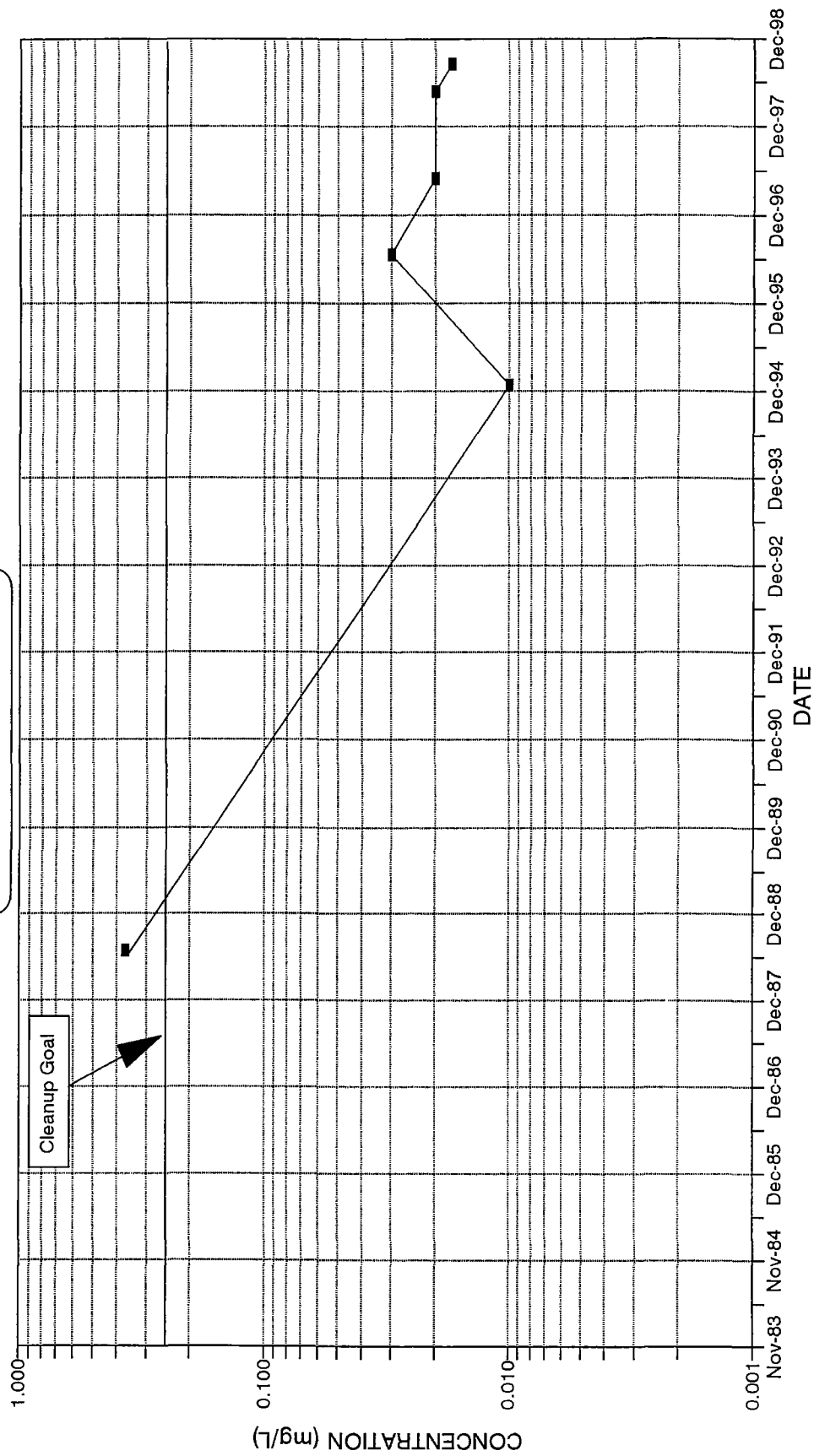
# VANADIUM VS. TIME MW-36



■ MW-36

\* = Value plotted is detection limit

# VANADIUM VS. TIME MW-37



\* = Value plotted is detection limit

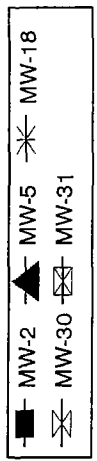
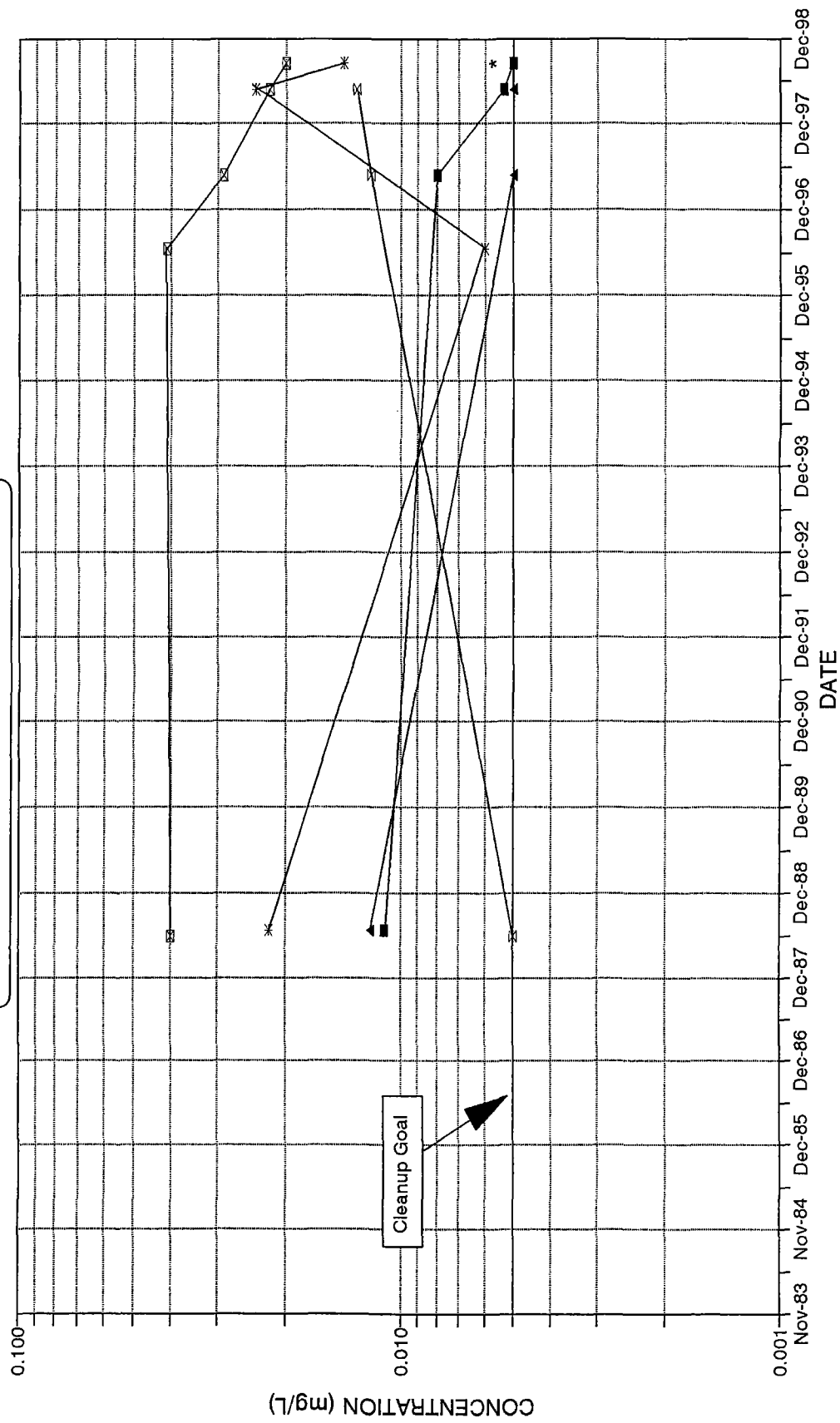
■ MW-37



APPENDIX D-7

TETRACHLOROETHENE

# TETRACHLOROETHENE VS. TIME



\* = Value plotted is detection limit.

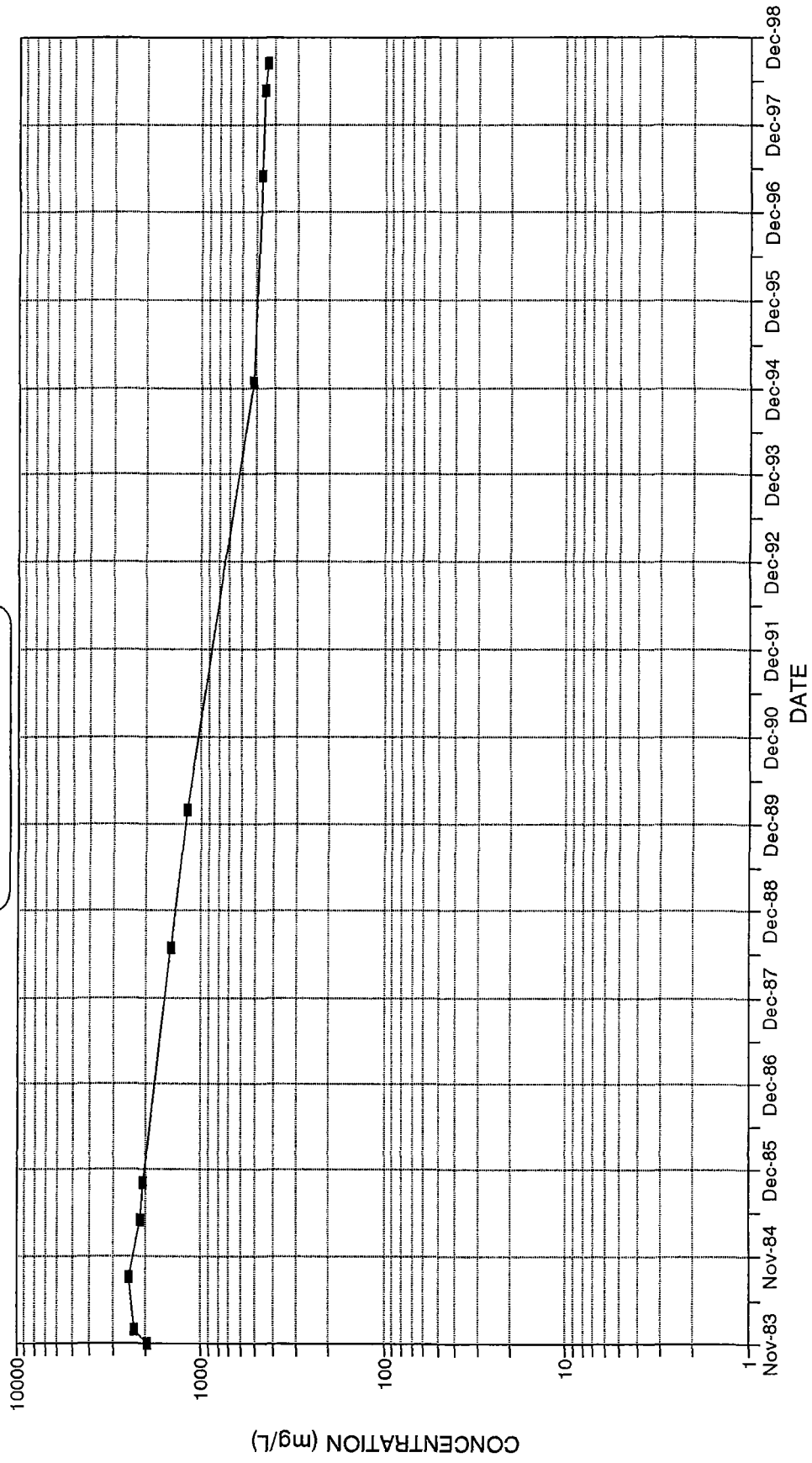




## APPENDIX D-8

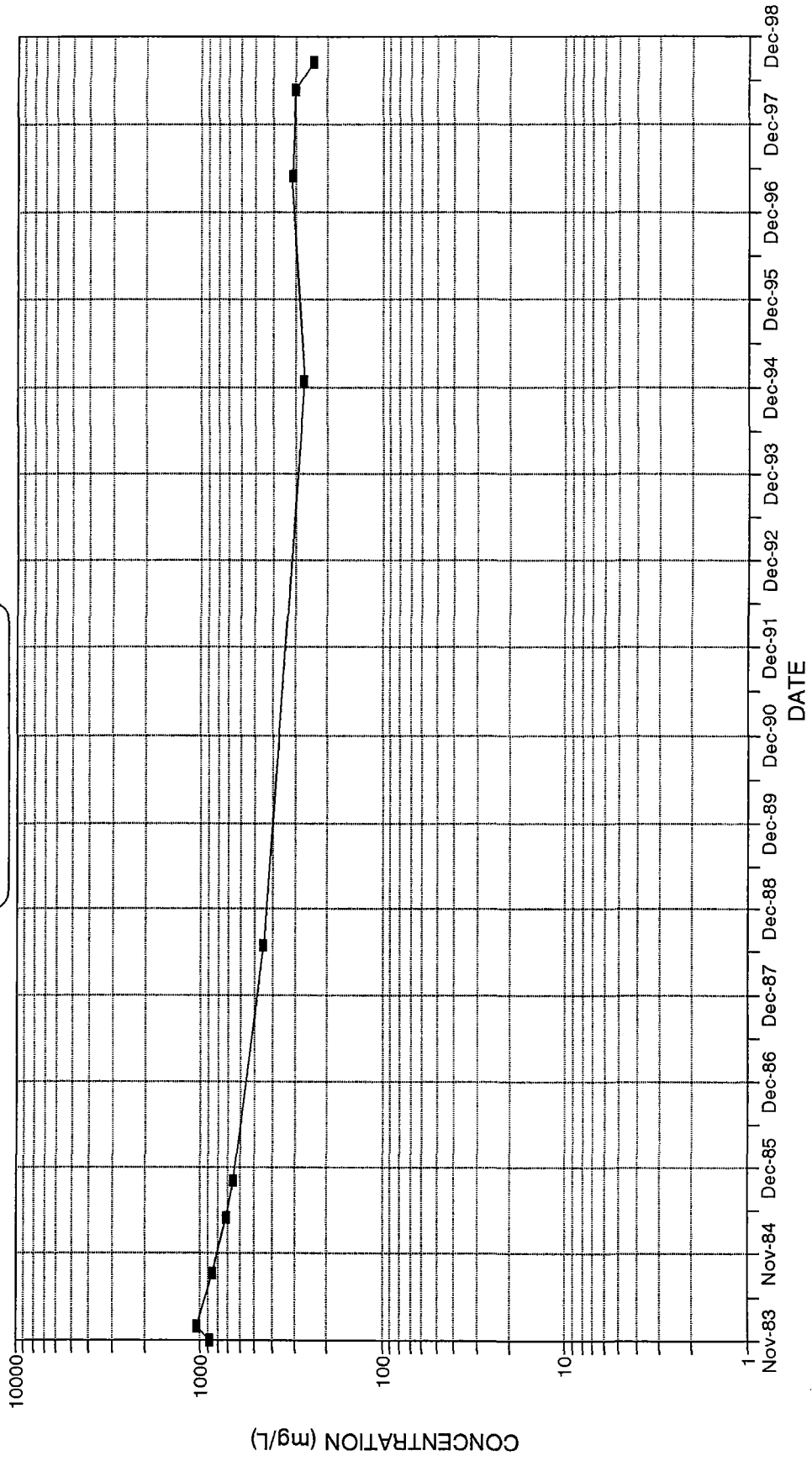
### SODIUM

SODIUM VS. TIME  
MW-2



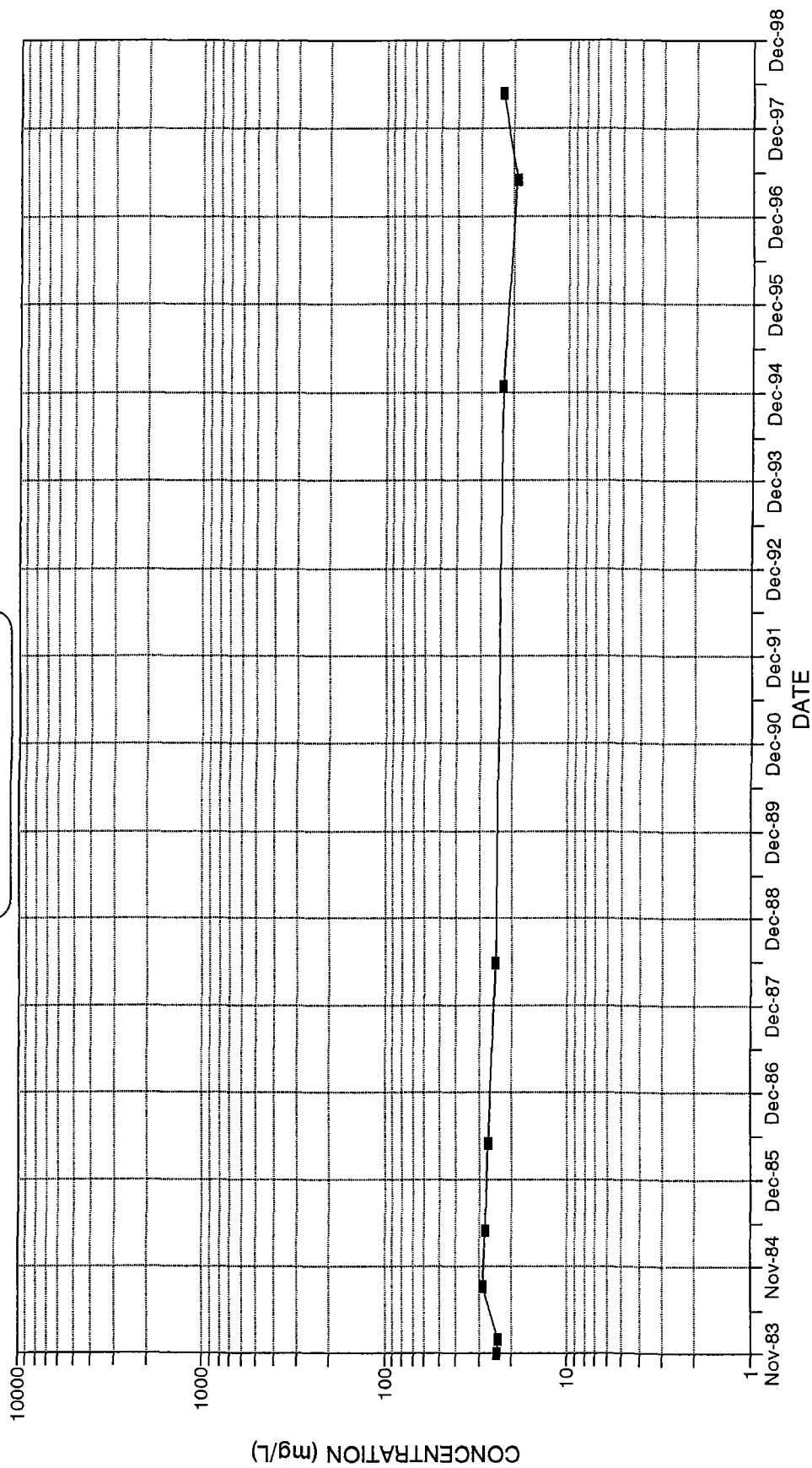
■ MW-2

SODIUM VS. TIME  
MW-5



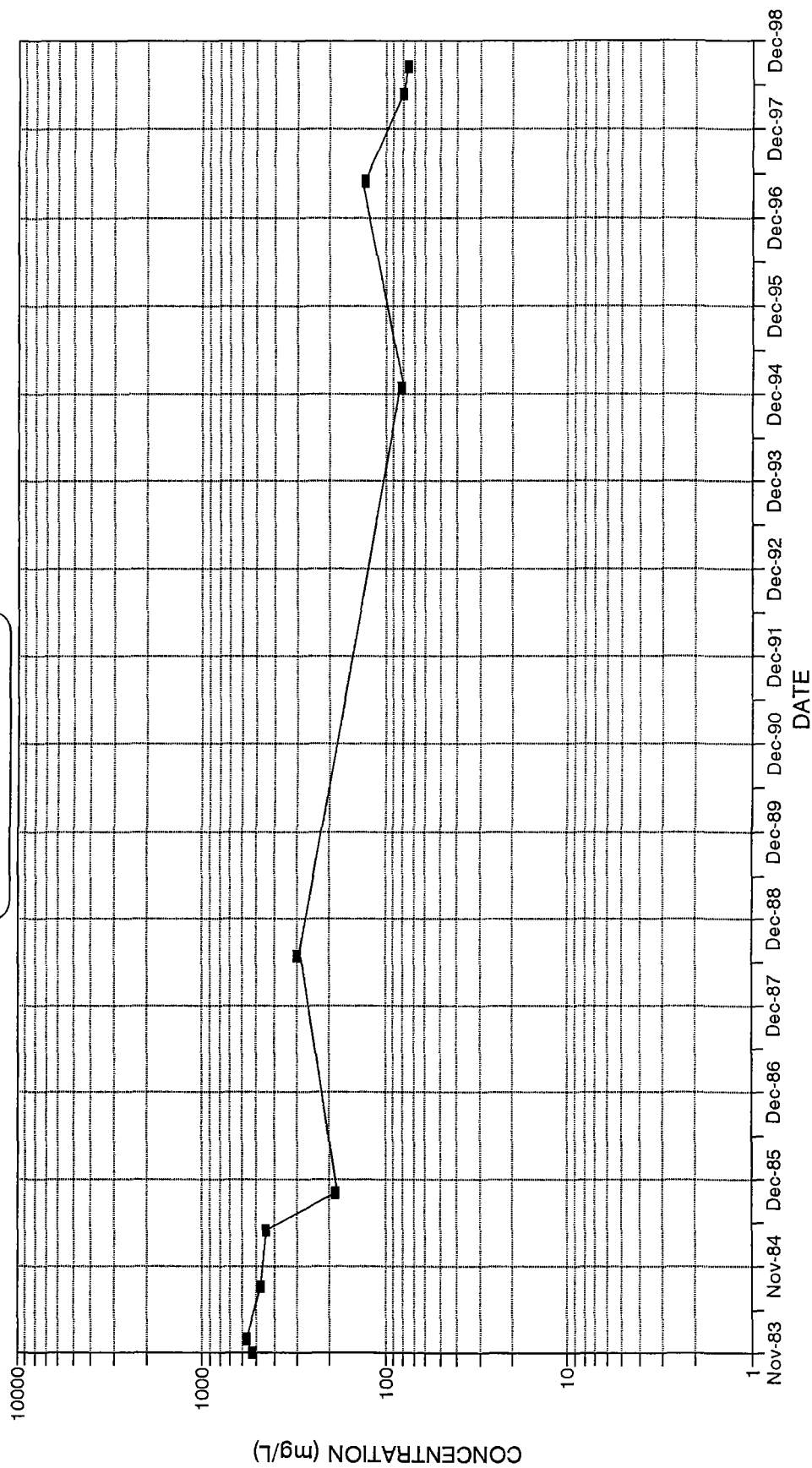
■ MW-5

SODIUM VS. TIME  
MW-12



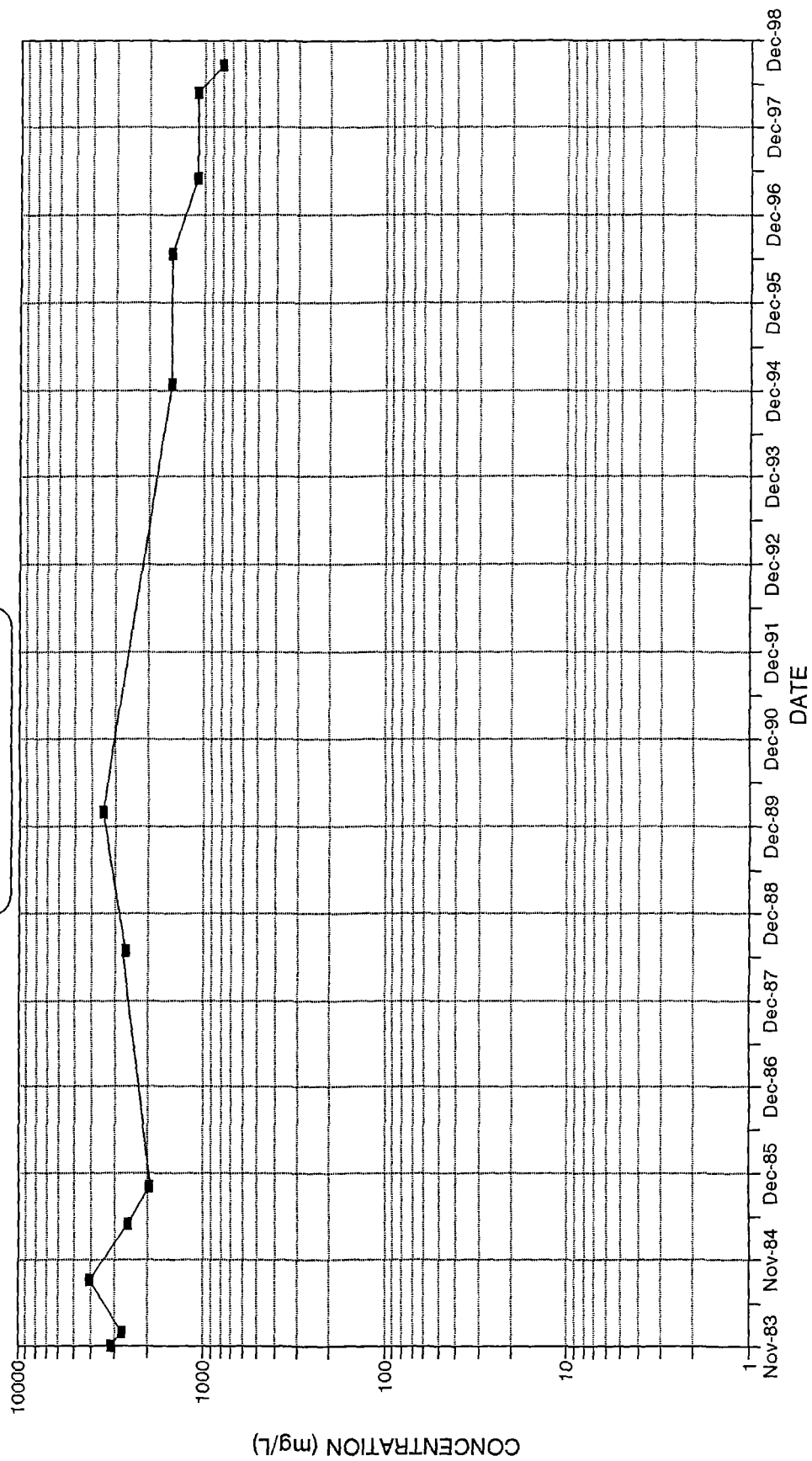
■ MW-12

SODIUM VS. TIME  
MW-16



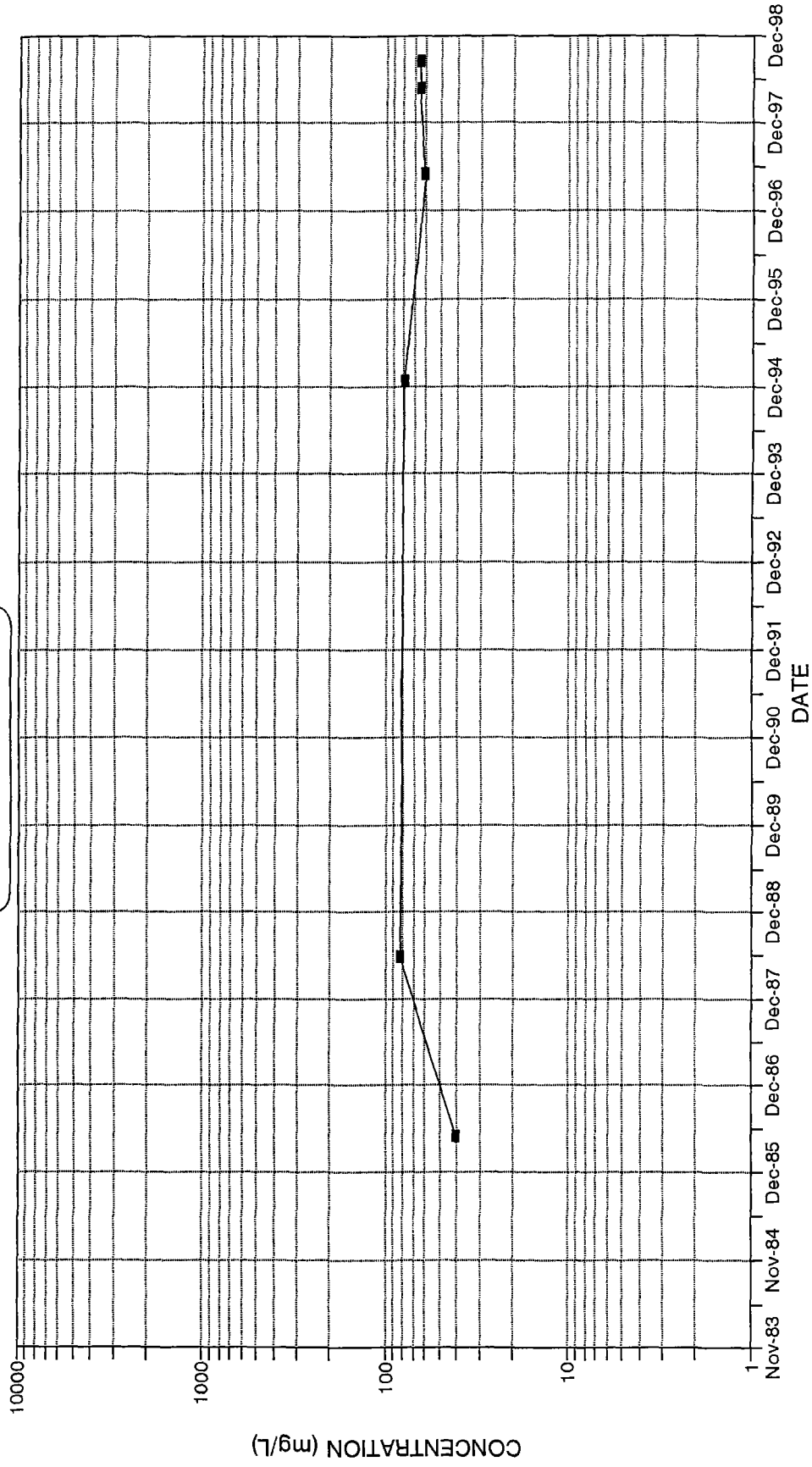
■ MW-16

SODIUM VS. TIME  
MW-18



■ MW-18

SODIUM VS. TIME  
MW-28

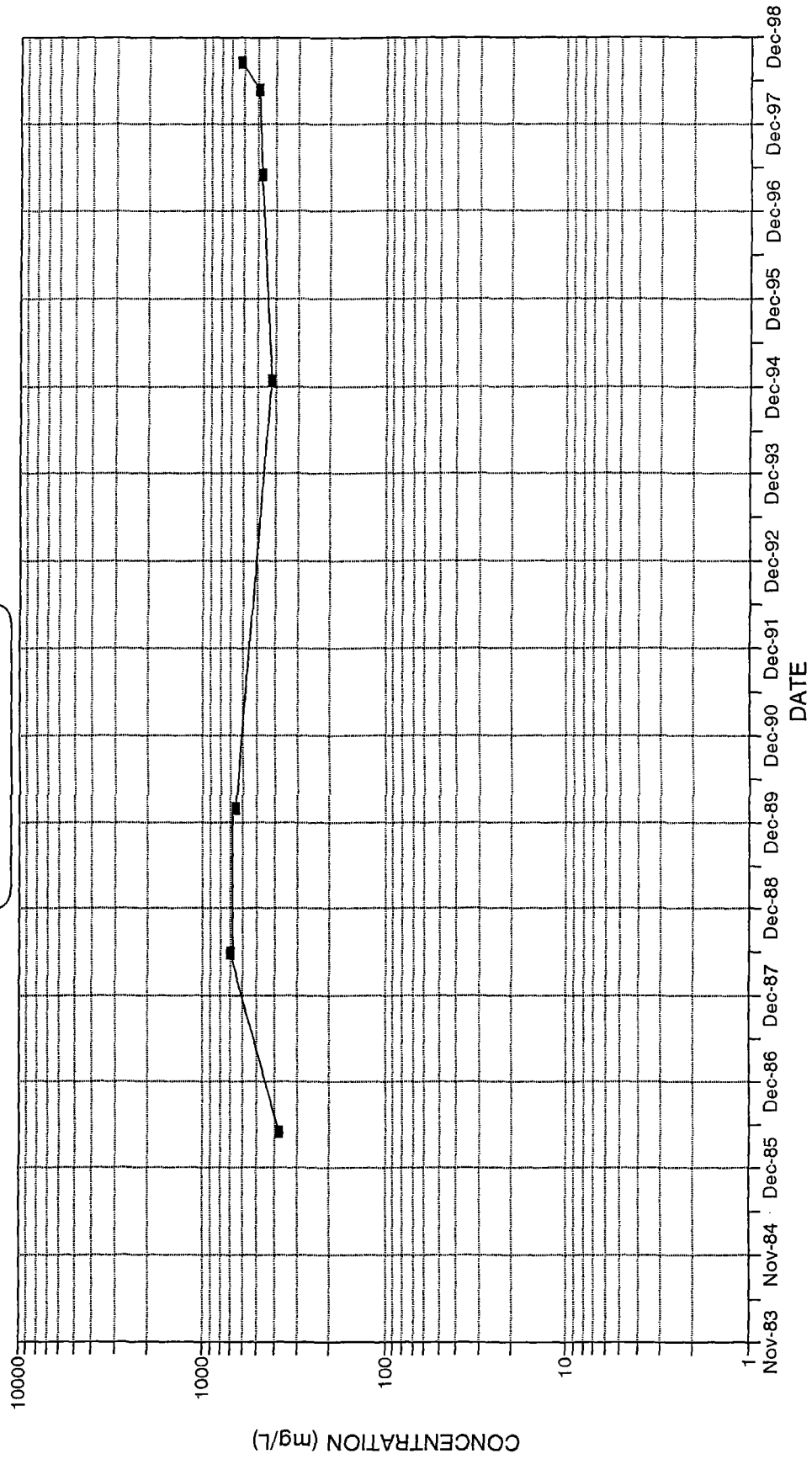


\* = Value plotted is detection limit

■ MW-28

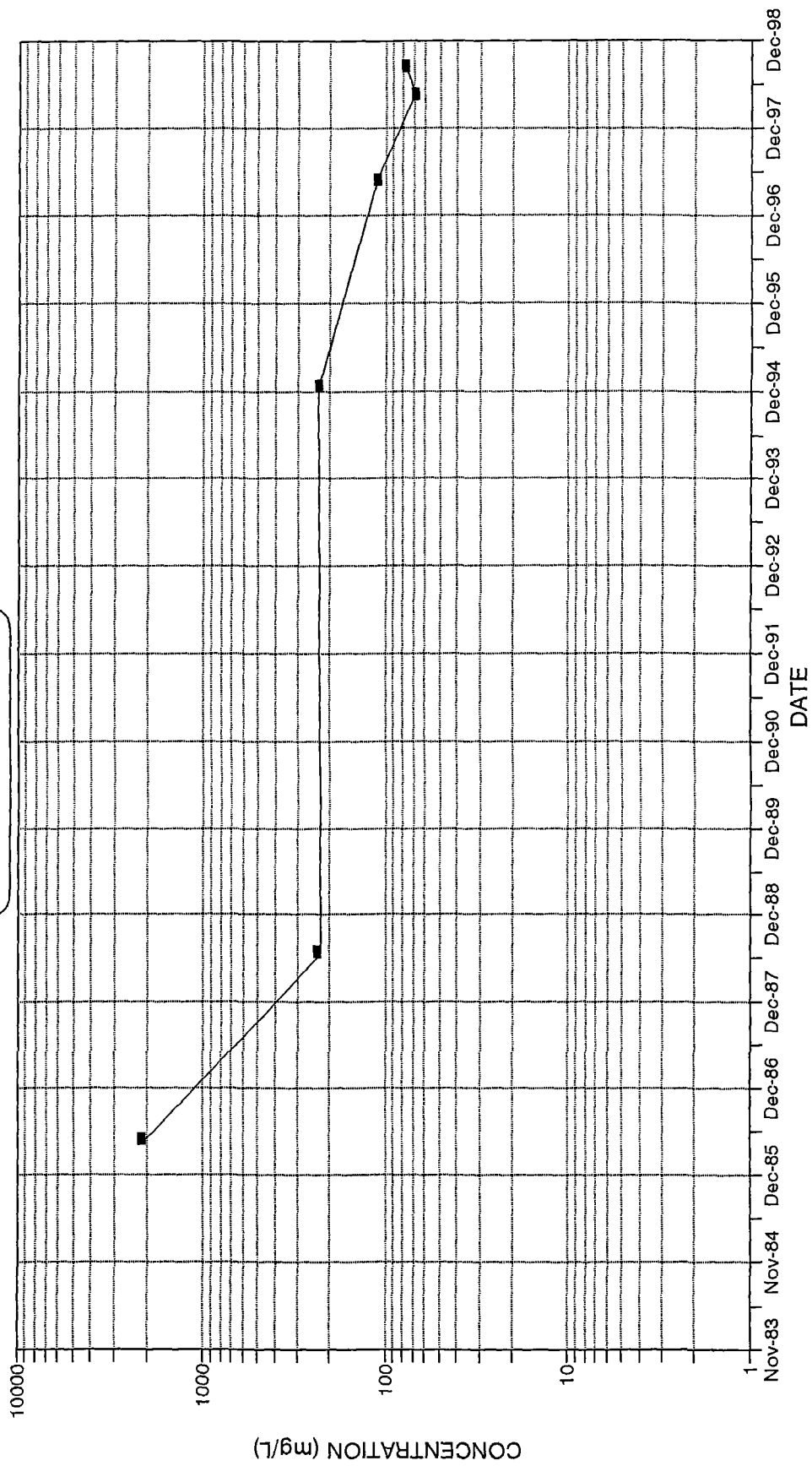


SODIUM VS. TIME  
MW-31



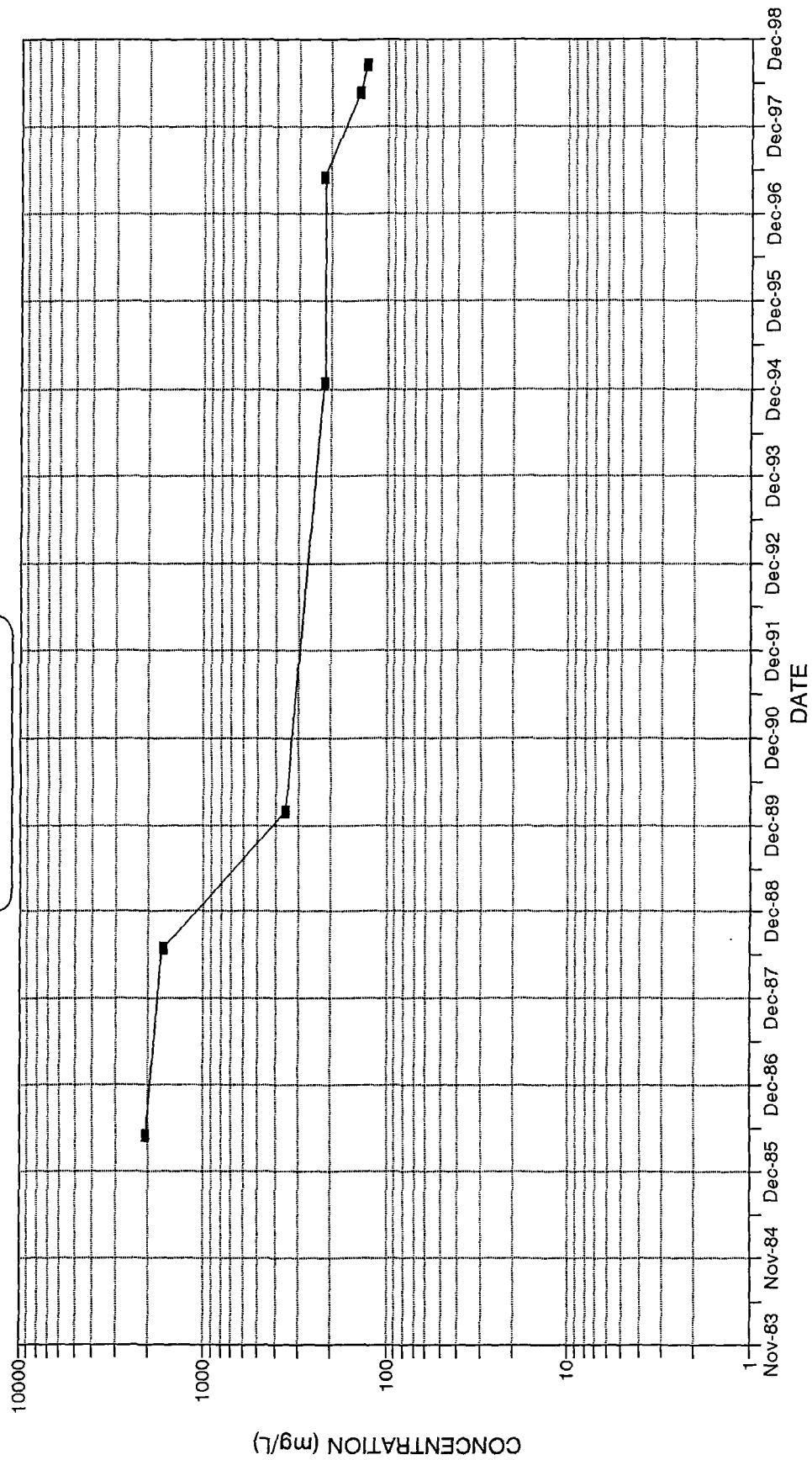
MW-31

SODIUM VS. TIME  
MW-32



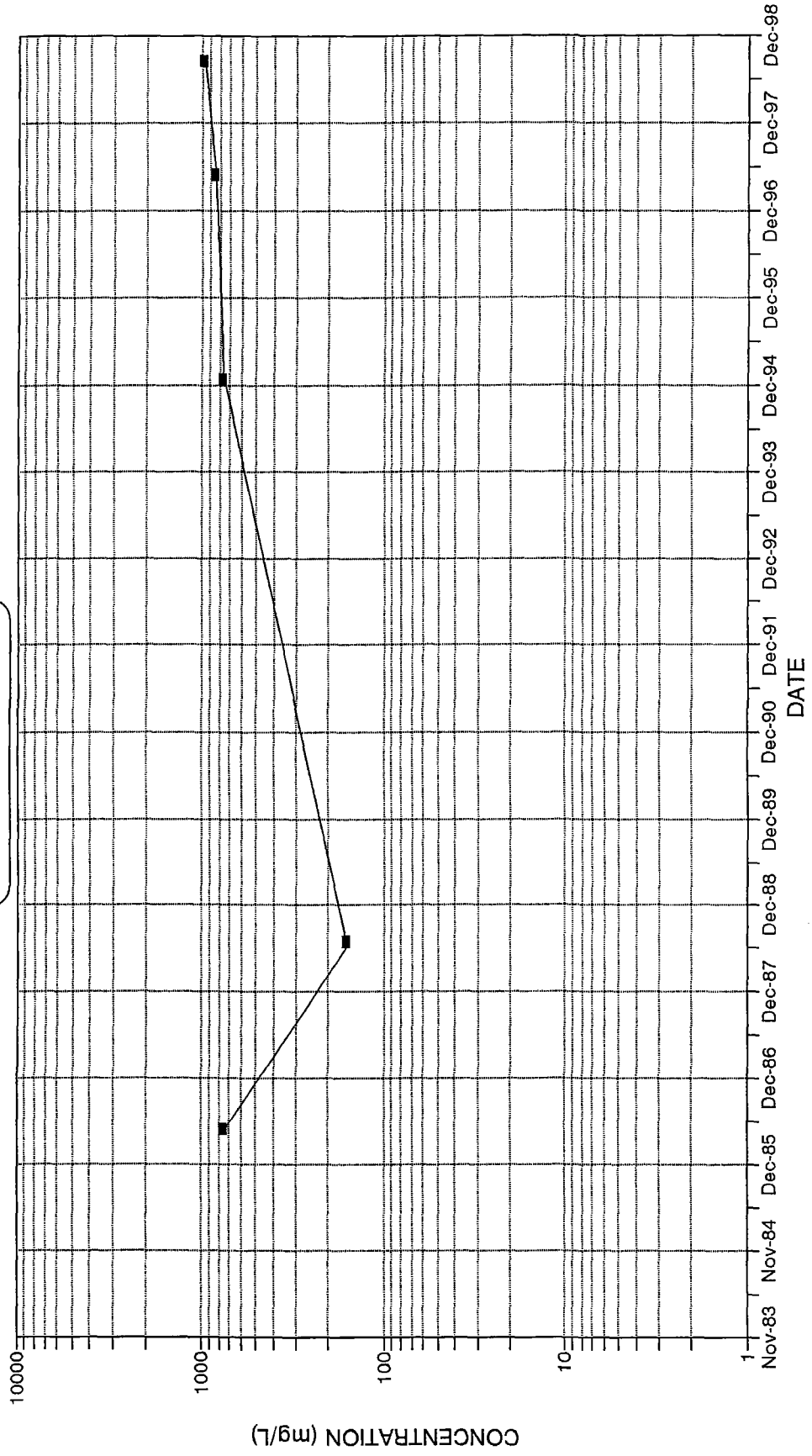
■ MW-32

SODIUM VS. TIME  
MW-35



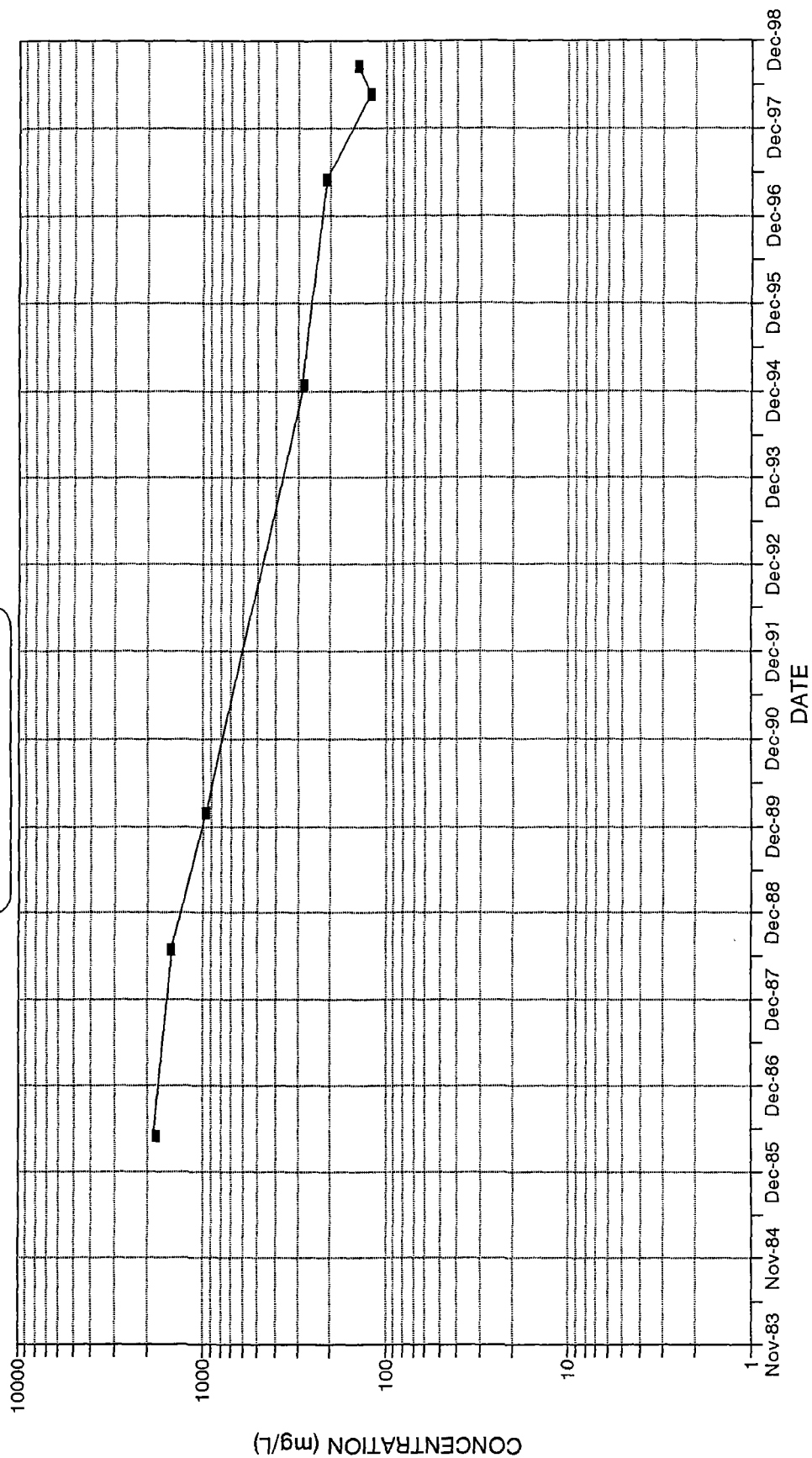
■ MW-35

SODIUM VS. TIME  
MW-36



■ MW-36

SODIUM VS. TIME  
MW-37



■ MW-37

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## APPENDIX E

## APPENDIX E

### CONTAMINANT MASS-IN-PLACE ESTIMATION SUPPORTING DATA

Appendix E-1    May 1997 Monitoring Event

Appendix E-2    May 1998 Monitoring Event

APPENDIX E-1

MAY 1997 MONITORING EVENT



APPENDIX E-1  
ANALYTICAL RESULTS FOR GROUND-WATER SAMPLES  
COLLECTED MAY 6-9, 1997

ORMET CORPORATION  
HANNIBAL, OHIO

SAMPLE I.D.:	MW-1	MW-2	MW-5	MW-7	MW-7 (Dup.)	MW-8	MW-10	MW-11	MW-12	MW-15	MW-15 (Dup.)	MW-16
DATE:	5/9/97	5/9/97	5/9/97	5/9/97	5/9/97	5/9/97	5/9/97	5/9/97	5/7/97	5/6/97	5/6/97	5/9/97
Cyanide, Total	<0.01	17	3.5	<0.01	<0.01	0.04	<0.01	0.09	<0.01	2.8	3.3	1.3
Fluoride	0.1	63	16	0.1	0.2	2.2	0.7	1.8	0.9	11	8.9	11

SAMPLE I.D.:	MW-17	MW-18	MW-19	MW-28	MW-29S	MW-29D	MW-30	MW-31	MW-31 (Dup.)	MW-32	MW-34S	MW-34D
DATE:	5/6/97	5/9/97	5/7/97	5/9/97	5/9/97	5/7/97	5/9/97	5/8/97	5/9/97	5/6/97	5/6/97	5/9/97
Cyanide, Total	0.54	8.7	<0.10	0.11	0.6	0.18	<0.01	12	6.2	4.4	0.18	0.05
Fluoride	3.1	200	2.0	0.2	44	3.3	<0.1	110	93	19	8.1	3.6

SAMPLE I.D.:	MW-35	MW-36	MW-37	MW-39S	MW-39D	MW-40S	MW-40D	MW-41	MW-42S	MW-42D
DATE:	5/6/97	5/6/97	5/6/97	5/7/97	5/7/97	5/7/97	5/7/97	5/6/97	5/7/97	5/7/97
Cyanide, Total	16	8.1	13	3.6	0.06	0.72	0.59	<0.01	0.56	0.04
Fluoride	40	180	53	150	3.8	21	7.6	0.2	29	3.2

NOTE: All results in mg/L.

98-E1a.WC3

APPENDIX E-1 (CONT.)  
PLUME CONTOUR AREA CALCULATIONS  
FOR TOTAL CYANIDE AND FLUORIDE

Page 2 of 5

ORMET PRIMARY ALUMINUM SUPERFUND SITE  
HANNIBAL, OHIO

TOTAL CYANIDE	CONTOUR INTERVAL (from Figure 3)	CONTOUR AREA in square feet (estimated using CAD* software)
	>15 mg/L (rt)	30,864
	>15 mg/L (lt)	18,198
	10-15 mg/L	351,126
	5-10 mg/L	274,330
	1-5 mg/L	580,778
	0.2-1 mg/L	376,727

TOTAL FLUORIDE	CONTOUR INTERVAL (from Figure 2)	CONTOUR AREA in square feet (estimated using CAD* software)
	>200 mg/L	5,153
	150-200 mg/L	17,765
	>150 mg/L (rt)	11,337
	100-150 mg/L	158,399
	>100 mg/L	11,543
	50-100 mg/L (lg)	236,204
	50-100 mg/L (sml)	33,309
	>50 mg/L	13,291
	10-50 mg/L	827,869
	4-10 mg/L	450,443

\* CAD - Computer Aided Drafting

98-E1B.123

APPENDIX E-1 (CONT.)  
AVERAGE AQUIFER THICKNESS CALCULATIONS  
WITHIN EACH PLUME CONTOUR INTERVAL

Page 3 of 5

ORMET CORPORATION  
HANNIBAL, OHIO

TOTAL CYANIDE

CONTOUR INTERVAL (from Figure 3)	MONITORING WELL ID	AQUIFER THICKNESS (in feet)	AVERAGE AQUIFER THICKNESS (b, in feet)
>15 mg/L (rt)	MW-35	11	11
>15 mg/L (lt)	MW-2	28	28
10-15 mg/L	MW-37 MW-31 MW-35 MW-2	18 20 11 28	19
5-10 mg/L	MW-18 MW-32 MW-36	21 16 15	17
1-5 mg/L	MW-5 MW-16 MW-39 MW-32 MW-15	27 35 41 16 20	28
0.2-1 mg/L	MW-28 MW-30 MW-8 MW-40 MW-29 MW-42	26 13 28 38 41 45	32

APPENDIX E-1 (CONT.)  
AVERAGE AQUIFER THICKNESS CALCULATIONS  
WITHIN EACH PLUME CONTOUR INTERVAL

ORMET CORPORATION  
HANNIBAL, OHIO

FLUORIDE

CONTOUR INTERVAL (from Figure 2)	MONITORING WELL ID	AQUIFER THICKNESS (in feet)	AVERAGE AQUIFER THICKNESS (b, in feet)
>200 mg/L	MW-18	21	21
150-200 mg/L	MW-18	21	21
>150 mg/L	MW-36	15	15
100-150 mg/L	MW-31 MW-36 MW-18	20 15 21	19
>100 mg/L	MW-39	41	41
50-100 mg/L (lg)	MW-2 MW-32 MW-31	28 16 20	21
50-100 mg/L (sml)	MW-39 MW-42 MW-29	41 45 41	42
>50 mg/L	MW-37	18	18
10-50 mg/L	MW-35 MW-15 MW-5 MW-40 MW-29 MW-42 MW-16 MW-32	11 20 27 38 41 45 35 16	29
4-10 mg/L	MW-28 MW-30 MW-1 MW-11	47 13 16 32	27

APPENDIX E-1 (CONT.)  
TOTAL CYANIDE AND FLUORIDE MASS-IN-PLACE  
CALCULATION WORKSHEET

ORMET CORPORATION  
HANNIBAL, OHIO

Contour Interval (from Figure 3)	Contour Interval Area (in square feet)	Average Aquifer Thickness (in feet)	1. Aquifer Volume (in cubic feet) VA	2. Volume of Ground Water (in cubic feet) Vgw	3. Volume of Ground Water (in Liters) Vgw	Average Concentration (mg/L) Cwl	4. Mass-in-Place for each interval (in mg) Mi	5. Mass-in-Place for each interval (in lbs) Mi
TOTAL CYANIDE	>15 mg/L (rt)	11	339,504	84,876	2,403,688	16.0	38,459,008	85
	>15 mg/L (lt)	28	509,544	127,386	3,607,572	17.0	61,328,724	135
	10-15 mg/L	19	6,671,394	1,667,849	47,233,483	12.5	590,418,538	1,302
	5-10 mg/L	17	4,663,610	1,165,903	33,018,372	7.5	247,637,790	546
	1-5 mg/L	28	16,261,784	4,065,446	115,133,431	3.0	345,400,293	762
	0.2-1 mg/L	32	12,055,264	3,013,816	85,351,269	0.6	51,210,761	113
TOTAL Cyanide Mw:							2,943	
FLUORIDE	(from Figure 2)							
	>200 mg/L	21	108,213	27,053	766,141	200.0	153,228,200	338
	150-200 mg/L	21	373,065	93,266	2,641,293	175.0	462,226,275	1,019
	>150 mg/L	15	170,055	42,514	1,203,996	180.0	216,719,280	478
	100-150 mg/L	19	3,009,581	752,395	21,307,826	125.0	2,663,478,250	5,873
	>100 mg/L	41	473,263	118,316	3,350,709	150.0	502,606,350	1,108
	50-100 mg/L (lg)	21	4,960,263	1,240,066	35,118,669	75.0	2,633,900,175	5,808
	50-100 mg/L (sm)	42	1,398,936	349,734	9,904,467	75.0	742,835,025	1,638
	>50 mg/L	18	239,238	59,810	1,893,819	53.0	89,772,407	198
	10-50 mg/L	29	24,008,201	6,002,050	169,978,056	30.0	5,099,341,680	11,244
TOTAL Fluoride Mw:							29,033	
							602,746,739	

1.  $VA = A \times b$
2.  $Vgw = VA \times n$
3.  $Vgw$  in ft<sup>3</sup> multiplied by 28.32 L/ft<sup>3</sup> =  $Vgw$  in Liters
4.  $Mi = Vgw \times Cwl$
5.  $Mi$  in mg divided by 1000 mg/g multiplied by 2.205x10<sup>-3</sup> lb/g =  $Mi$  in pounds



APPENDIX E-2

MAY 1998 MONITORING EVENT

APPENDIX E-2  
ANALYTICAL RESULTS FOR GROUND-WATER SAMPLES  
COLLECTED MAY 4-7, 1998

ORMET CORPORATION  
HANNIBAL, OHIO

SAMPLE I.D.:	MW-1	MW-2	MW-5	MW-7	MW-8	MW-10	MW-11	MW-12	MW-15	MW-16
DATE:	5/5/98	5/6/98	5/6/98	5/5/98	5/5/98	5/5/98	5/5/98	5/6/98	5/4/98	5/6/98
Cyanide, Total	<0.01	13	1.3	<0.01	0.02	0.15	0.02	<0.01	0.49	2.0
Fluoride	0.20	68	18	0.20	2.3	0.60	1.7	0.80	0.40	11

SAMPLE I.D.:	MW-17	MW-18	MW-19	MW-28	MW-29S	MW-29D	MW-30	MW-31	MW-32	MW-32 (Dup.)	MW-34S	MW-34D
DATE:	5/7/98	5/6/98	5/4/98	5/5/98	5/7/98	5/7/98	5/6/98	5/6/98	5/4/98	5/4/98	5/98	5/7/98
Cyanide, Total	0.72	9.8	<0.01	0.12	0.18	0.17	<0.01	9.3	2.5	2.5	NS	0.09
Fluoride	3.4	260	1.4	0.20	26	3.5	0.10	100	7.7	8.0	NS	3.9

SAMPLE I.D.:	MW-35	MW-36	MW-37	MW-39S	MW-39D	MW-40S	MW-40D	MW-41	MW-42S	MW-42D
DATE:	5/4/98	5/98	5/4/98	5/5/98	5/5/98	5/5/98	5/5/98	5/4/98	5/6/98	5/6/98
Cyanide, Total	15	NS	6.4	2.3	0.04	0.36	0.49	<0.01	0.52	0.07
Fluoride	27	NS	6.8	98	3.6	39	19	0.30	27	3.3

NOTE: All results in mg/L.  
NS = Not sampled, well damaged during remedial construction. Not accessible for sampling during 5/98 event.



APPENDIX E-2 (CONT.)  
 PLUME CONTOUR AREA CALCULATIONS  
 FOR TOTAL CYANIDE AND FLUORIDE  
 BASED ON RESULTS OF SAMPLING CONDUCTED MAY 4-7, 1998

Page 2 of 5

ORMET PRIMARY ALUMINUM SUPERFUND SITE  
 HANNIBAL, OHIO

TOTAL CYANIDE	CONTOUR INTERVAL (from Figure 3)	CONTOUR AREA in square feet (estimated using CAD* software)
	10-15 mg/L (MW-2) 10-15 mg/L (FSPSA) 5-10 mg/L 1-5 mg/L 0.2-1 mg/L	38,526 141,017 416,575 730,644 321,707

TOTAL FLUORIDE	CONTOUR INTERVAL (from Figure 2)	CONTOUR AREA in square feet (estimated using CAD* software)
	>200 mg/L 150-200 mg/L (MW-18) 150-200 mg/L (MW-36) 100-150 mg/L 50-100 mg/L (lg) 50-100 mg/L (sml) 10-50 mg/L 4-10 mg/L	5,485 11,501 10,699 109,819 274,638 26,097 786,913 352,899

\* CAD - Computer Aided Drafting

98-E2b.123

APPENDIX E-2 (CONT.)  
AVERAGE AQUIFER THICKNESS CALCULATIONS  
WITHIN EACH PLUME CONTOUR INTERVAL  
BASED ON RESULTS OF SAMPLING CONDUCTED MAY 4-7, 1998

Page 3 of 5

ORMET CORPORATION  
HANNIBAL, OHIO

TOTAL CYANIDE

CONTOUR INTERVAL (from Figure 3)	MONITORING WELL ID	AQUIFER THICKNESS (in feet)	AVERAGE AQUIFER THICKNESS (b, in feet)
10-15 mg/L (FSPSA)	MW-18	17.81	15.90
	MW-31	19.83	
	MW-35	10.08	
10-15 mg/L (MW-2)	MW-2	26.24	26.24
5-10 mg/L	MW-2	26.24	20.19
	MW-5	24.63	
	MW-18	17.81	
	MW-31	19.83	
	MW-32	16.50	
	MW-37	16.11	
1-5 mg/L	MW-5	24.63	25.76
	MW-8	25.38	
	MW-16	33.37	
	MW-18	17.81	
	MW-28	23.80	
	MW-39	38.86	
0.2-1 mg/L	MW-32	16.50	29.40
	MW-5	24.63	
	MW-10	26.08	
	MW-15	19.73	
	MW-17	39.92	
	MW-28	23.80	
	MW-30	10.89	
	MW-8	25.38	
	MW-40	37.65	
	MW-29	41.51	
	MW-42	44.49	

APPENDIX E-2 (CONT.)  
AVERAGE AQUIFER THICKNESS CALCULATIONS  
WITHIN EACH PLUME CONTOUR INTERVAL  
BASED ON RESULTS OF SAMPLING CONDUCTED MAY 4-7, 1998

Page 4 of 5

ORMET CORPORATION  
HANNIBAL, OHIO

FLUORIDE

CONTOUR INTERVAL (from Figure 2)	MONITORING WELL ID	AQUIFER THICKNESS (in feet)	AVERAGE AQUIFER THICKNESS (b, in feet)
>200 mg/L	MW-18	17.81	17.81
150-200 mg/L	MW-18	17.81	17.81
150-200 mg/L	MW-36	15*	15*
100-150 mg/L	MW-31 MW-36 MW-18	19.83 15* 17.81	17.55
50-100 mg/L (lg)	MW-2 MW-18 MW-32 MW-31 MW-36 TH-11	26.24 17.81 16.50 19.83 15* 18.86	19.04
50-100 mg/L (sml)	MW-39	38.86	38.86
10-50 mg/L	MW-2 MW-35 MW-5 MW-40 MW-29 MW-42 MW-16 MW-32 TH-11	26.24 10.08 24.63 37.65 41.51 44.49 33.37 16.50 18.86	28.15
4-10 mg/L	MW-28 MW-30 MW-1 MW-11 MW-37 TH-11 MW-15 MW-34 MW-17 MW-12 MW-14	23.80 10.89 15.72 30.16 16.11 18.86 19.73 32.17 39.92 44.15 49.35	27.35

\* - MW-36 damaged and inaccessible during 5/98 sampling event. Aquifer thickness taken from historical data.

APPENDIX E-2 (CONT.)  
TOTAL CYANIDE AND FLUORIDE MASS-IN-PLACE  
CALCULATION WORKSHEET  
BASED ON RESULTS OF SAMPLING CONDUCTED MAY 4-7, 1998

ORMET CORPORATION  
HANNIBAL, OHIO

Contour Interval (from Figure 3)	Contour Interval Area (in square feet)	Average Aquifer Thickness (in feet)	1. Aquifer Volume (in cubic feet)	2. Volume of Ground Water (in cubic feet)	3. Volume of Ground Water (in Liters)	Average Concentration (mg/L)	4. Mass-in-Place for each interval (in mg)	5. Mass-in-Place for each interval (in lbs)
	A	b	VA	Vgw	Vgw	Cwi	Mi	Mi
TOTAL								
10-15 mg/L (MW-2)	38,526	26.24	1,010,922	252,731	7,157,342	13.0	93,045,446	205.1
10-15 mg/L (SPSA)	141,017	15.90	2,242,170	560,542	15,874,549	12.5	198,431,863	437.5
5-10 mg/L	416,575	20.19	8,410,649	2,102,662	59,547,388	7.5	446,605,410	984.6
1-5 mg/L	730,644	25.76	18,821,388	4,705,347	133,255,427	3.0	399,766,281	881.3
0.2-1 mg/L	321,707	29.40	9,458,186	2,364,546	66,963,943	0.6	40,178,366	88.6
							TOTAL Cyanide Mw:	2,597.1
FLUORIDE								
>200 mg/L	5,485	17.81	97,139	24,285	687,751	260.00	178,815,260	394.2
150-200 mg/L (MW-18)	11,501	17.81	204,833	51,208	1,450,211	175.0	253,786,925	559.5
150-200 mg/L (MW-36)	10,699	15	160,485	40,121	1,136,227	175.0	198,839,725	438.4
100-150 mg/L	109,819	17.55	1,927,323	481,831	13,645,454	125.0	1,705,681,750	3,760.4
50-100 mg/L (lg)	274,638	19.04	5,229,108	1,307,277	37,022,085	75.0	2,776,656,375	6,121.5
50-100 mg/L (smi)	26,097	38.86	1,014,129	253,532	7,180,026	75.0	538,501,950	1,187.2
10-50 mg/L	786,913	28.15	22,151,600	5,537,900	156,833,328	30.0	4,704,999,840	10,372.8
4-10 mg/L	352,899	27.35	9,651,788	2,412,947	68,334,659	7.0	478,342,613	1,054.6
							TOTAL Fluoride Mw:	23,888.6

1.  $VA = A \times b$
2.  $Vgw = VA \times n$
3.  $Vgw$  in ft<sup>3</sup> multiplied by 28.32 L/ft<sup>3</sup> =  $Vgw$  in Liters
4.  $Mi = Vgw \times Cwi$
5.  $Mi$  in mg divided by 1000 mg/g multiplied by 2.205x10<sup>-3</sup> lb/g =  $Mi$  in pounds